

Module Catalogue

for the Module studies (Bachelor)

Computer Science

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Abbreviations used

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Course types: \mathbf{E} = field trip, \mathbf{K} = colloquium, \mathbf{O} = conversatorium, \mathbf{P} = placement/lab course, \mathbf{R} = project, \mathbf{S} = seminar, \mathbf{T} = tutorial, $\ddot{\mathbf{U}}$ = exercise, \mathbf{V} = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: NUM = numerical grade, B/NB = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

15-May-2019 (2019-36) 27-Jun-2019 (2019-41) 14-Nov-2019 (2019-52) 22-Jan-2020 (2020-13) 06-May-2020 (2020-39) 22-Jul-2020 (2020-57) 17-Dec-2020 (2020-110) 10-Mar-2021 (2021-17)

Computer Science (2019)

09-Jun-2021 (2021-58) 22-Dec-2021 (2021-85) 05-Jul-2022 (2022-52) 31-Jan-2023 (2022-86) 15-Jun-2023 (2023-58) 13-Dec-2023 (2023-107) 07-Aug-2024 (2024-82) 22-Jan-2025 (2025-1)

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This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.



Summer Term 2019

(ECTS credits)

Module title				Abbreviation	
Algorithmic Graph Theory				10-I-AGT-152-m01	
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable. Intended learning outcomes The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms. Courses (type, number of weekly contact hours, language – if other than German) V (2) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 45 minutes parts at at minutes parts.					
Langua credital	ge of a ble for	ssessment: German and/ bonus	or English		
Allocat	ion of p	olaces			
Additional information					
Workload					
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	§ 22 II Nr. 3 b)				

Module	Module title Abbreviation					
Selected Basics of Computer Science				10-l-Gl-152-m01		
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + I	Ü (2)					
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h	150 h					
Teachir	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module	Module title Abbreviation					
Advanced Programming					10-I-APR-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
grams. and coo de a se cussed	If more de dup nsible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	e is to be conveyed offware security and	r, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	ts learr pleme ocessir	n advanced programming nted in multiple languag ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space ap y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +						
module is	s creditab	le for bonus)	ge — If other than German, (examination offered — if no	ot every semester, information on whether	
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Allocat	ion of p	olaces				
Additional information						
Worklo	Workload					
150 h	150 h					
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22	§ 22 II Nr. 3 b)					

Practication of mathematication of the structure of the struct	Module	Module title Abbreviation				
Module offered byDealInstitute of Computer ScienceECTSM=ture StratementInstitute of Computer ScienceInstitute of Computer ScienceECTSM=due IeelOnly after succ. completionDurativeModule IeelOnly after succ. completionDurativeModule IeelOnly after succ. completion1 semestriModule IeelOnly after succ. completionPractical regionModule IeelOnly after succ. completionContestricIndegraduate	Practical course in hardware					10-l-HWP-152-m01
Dear Studies Informatik (Computer Science) Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 10 (not) successfully completed	Module	coord	inator		Module offered by	
ECTSMete or gradingOnly after succ. compl. of module(s)10(not) successfully completedDurationModule levelOther prerequisites1 sem sterundergraduateContentsTractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complet microprocessor.Intended terming outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Courses (type, number of weekly contact hours, language – if other than German)P (6)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)Additional informationCourses to induce is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 20 hours total)<	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
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Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h					
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teachir	ng cycl	9			
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
§ 22 Nr. 3 b)	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22	Vr. 3 b)				

Module title				Abbreviation	
IT Security				10-l-SEC-191-m01	
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
 Till (ł N S re P ci 	heoreti nistoric es, pul etwork oftwar everse latform urity m	ical aspects: information- cal and modern ciphers, h blic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co ash functions, pseuc ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors iti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-
Intende	ed lear	ning outcomes			
Studen and and going to exercise	ts will l alyze s o unde es prov S (type r	be introduced to the main ecurity of a system critica rstand the purpose and fiv ride some hands-on expenses	n concepts and abstra Illy from the attacker unction of several sec rience of security flow anguage — if other than Ger	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The
V (2) +	Ü (2)				
Module	e taugh	t in: German and/or Engl	ish		
Methoo module is	l of ass creditab	Sessment (type, scope, langua Ile for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus					
Allocation of places					
Additional information					
Workload					
150 h	150 h				
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				

Module	Nodule title Abbreviation				
Practical Course in Programming					10-I-PP-191-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1-2 sem	nester	undergraduate	Intended learning of GdP. It is therefore s	utcomes of the follow trongly recommende	ving module are required: 10-l- ed to complete this before.
Conten	ts				
The pro	gramm	iing language Java. Indep	endent creation of si	nall to middle-sized	, high-quality Java programs.
Intende	ed learı	ning outcomes			
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (6)					
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
practica minutes If annoi	al exam s) unced	nination (programming e	vercises, approx. 240	hours) and written e	examination (approx. 60 to 120 tion may be replaced by an oral
examin prox. 15	ation o ; minut	of one candidate each (ap es per candidate).	prox. 20 minutes) or	an oral examination	in groups of 2 candidates (ap-
Allocati	ion of p	olaces			
Additional information					
Workload					
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 49 Nr. 1 c)					
§ 69 N	9 69 I Nr. 1 0J				

Module title Abbreviati					Abbreviation
Project Presentation					10-I-PV-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. Th hort talk and optiona	ware project) analogous to a pre- he project, which may also be ally a live demonstration.
Intende	ed learn	ning outcomes			
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (5)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)
Allocat	ion of p	olaces			
Additional information					
Workload					
150 h					
Teachir	ng cycl	9			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	§ 22 II Nr. 3 b)				

Module	Module title Abbreviation					
Semina	ır - Sele	ected Topics in Computer	Science 1		10-I-SEM1-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 rerent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Method module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussion Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	n (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h	150 h					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 N	§ 22 Nr. 3 b)					

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learn	ning outcomes				
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-u Langua	p repoi ge of a	t on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal infe	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module title					Abbreviation
Control	Princi	ples of Modern Communi	cation Systems		10-l-SKS-191-m01
Module	coord	inator		Module offered by	
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
8	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Content	ts				
• M • B • M • H • C • S • C	Iultime roadba lobile (ome Ad urrent oftware ontrol	dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente tion of analytical perform	f Things (IoT) N) and deployed on the state of the second se	ne Internet	
Intende	d learr	ning outcomes			
The stur dern co measur analytic	dents p mmuni ement cal perf	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered i	ructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of
	(type, ii	umber of weekly contact hours, is	anguage — If other than Ger	iiidii)	
Method module is	l of ass creditab	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
240 h					
Teachin	ig cycl	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	

Module	Module title Abbreviation					
Practica	al cour	se in software			10-l-SWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in ; p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§691N	§ 69 Nr. 1 d)					



Winter Term 2019

(ECTS credits)

Module title					Abbreviation
Algorithmic Graph Theory 10-I-AGT-152-m01					10-I-AGT-152-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
colourin of graph program	ngs, wo h probl ns or h ed learn	ork with planar graphs an lems, we also become far ow we show that they are ning outcomes	d find out how the ra niliar with new conce fixed parameter con	nking algorithm of G epts, for example how nputable.	ioogle works. Using the examples w we model problems as linear
The stu cipants course,	dents a are ab stude	are able to model typical le to decide which tool fr nts learn in detail how to	problems in compute om the course helps estimate the run time	er science as graph p solve a given graph e of given graph algo	problems. In addition, the parti- problem algorithmically. In this prithms.
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	Ü (2)				
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examin unced l ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22	§ 22 II Nr. 3 b)				

Module	Module title Abbreviation					
Selecte	Selected Basics of Computer Science				10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module title					Abbreviation	
Advanced Programming					10-I-APR-172-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
grams. and coo de a sei cussed.	lf more de dup nsible	e complex problems are to licates occur. In this lectu structure. Also, further to	b be tackled, subopti ire, further knowledg pics in the areas of s	mal results like long e is to be conveyed oftware security and	, incomprehensible functions on how to give programs and co- parallel programming are dis-	
Intende	ed leari	ning outcomes				
Student then im allel pro sing.	ts learr pleme ocessir s (type, n	n advanced programming nted in multiple language ng concepts are introduce	paradigms especiall es and their efficiency ed culminating in the anguage — if other than Ger	y suited for space ap y measured using sta use of GPU architect	oplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
V(2) + 1	Ü (2)					
Method module is	l of ass	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examin unced ation o minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap res per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	Additional information					
Workload						
150 h						
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Practication of mathematication of the structure of the struct	Module	Module title Abbreviation				
Module offered byDealInstitute of Computer ScienceECTSM=ture StratementInstitute of Computer ScienceInstitute of Computer ScienceECTSM=due IeelOnly after succ. completionDurativeModule IeelOnly after succ. completionDurativeModule IeelOnly after succ. completion1 semestriModule IeelOnly after succ. completionPractical regionModule IeelOnly after succ. completionContestricIndegraduate	Practical course in hardware					10-l-HWP-152-m01
Dear Studies Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) in (not) successfully completed	Module	coord	inator		Module offered by	
ECTSMete or gradingOnly after succ. compl. of module(s)10(not) successfully completedDurationModule levelOther prerequisites1 sem sterundergraduateContentsTractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complet microprocessor.Intended terming outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Courses (type, number of weekly contact hours, language – if other than German)P (6)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)Additional informationCourses to induce is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 20 hours total)<	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
10 (not) successfully completed Duration Module level Other prerequisites 1 sem ster undergraduate Contents Fractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Module is creditable for bonus) Information of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Yorkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) S 22 II Nr. 3 b)	10	(not) s	successfully completed			
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places	Duratio	n	Module level	Other prerequisites		
Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO 1 (examination for teaching-degree programmes) § 22 Il Nr. 3 b)	1 seme	ster	undergraduate			
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts				
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of
The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Intende	ed learr	ning outcomes			
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	/ review, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	P (6)					
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces			
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
 Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additio	nal info	ormation			
Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload					
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h					
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
§ 22 II Nr. 3 b)	Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
	§ 22	Vr. 3 b)				

Module title					Abbreviation	
IT Secu	rity				10-l-SEC-191-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 The cold The cold N S re P c 	heoreti historic es, pul letwork oftware everse latform urity m	ical aspects: information- cal and modern ciphers, h olic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co bash functions, pseud ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors ti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed learı	ning outcomes				
Studen and and going to exercise	ts will I alyze s o unde es prov	be introduced to the main ecurity of a system critica rstand the purpose and fi vide some hands-on expe	n concepts and abstra ally from the attacker unction of several sec erience of security floo	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + I Module	Ü (2) taugh	t in: German and/or Engl	ish			
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annoi examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h	150 h					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practica	al Cour	se in Programming			10-I-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	nester	undergraduate	Intended learning of GdP. It is therefore s	utcomes of the follow trongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of si	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes If annoi	al exam s) unced	nination (programming e	vercises, approx. 240	hours) and written e	examination (approx. 60 to 120 tion may be replaced by an oral	
examin prox. 15	ation o ; minut	of one candidate each (ap es per candidate).	prox. 20 minutes) or	an oral examination	in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§491N	lr. 1 c)					
§ 69 l Nr. 1 d)						

Module title Abbreviation					Abbreviation	
Project Presentation					10-I-PV-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.	
Intende	ed learr	ning outcomes				
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (5)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
present ge of co Langua	tation o ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	Workload					
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22	Vr. 3 b)					

Module	Module title Abbreviation					
Semina	ır - Sele	ected Topics in Computer	Science 1		10-I-SEM1-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 rerent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Method module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussion Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	n (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h	150 h					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 N	§ 22 Nr. 3 b)					

Module title					Abbreviation	
Seminar - Selected Topics in Computer Science 2					10-l-SEM2-152-m01	
Module coordinator				Module offered by		
Dean of Studies Informatik (Computer Science)			Science)	Institute of Comput	er Science	
ECTS	ECTS Method of grading Only after succ. com			pl. of module(s)		
5	, numerical grade					
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learn	ning outcomes				
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-up report on tutoring activities (5 to 10 pages) Language of assessment: German and/or English						
Allocation of places						
Additional information						
Workload						
150 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module title					Abbreviation		
Control Principles of Modern Communication Systems					10-l-SKS-191-m01		
Module coordinator				Module offered by			
holder of the Chair of Computer Science III			e III	Institute of Comput	er Science		
ECTS Method of grading			Only after succ. compl. of module(s)				
8	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Content	ts						
• C M • B • H • C • S • C	 Control Mechanisms of Modern Communication Systems Multimedia Networking Broadband Access Networks Mobile Communication Systems Home Access Networks Current trends such as Internet of Things (IoT) Software Defined Networking (SDN) Control mechanisms implemented and deployed on the Internet 						
Intende	ed learn	ning outcomes					
The stur dern co measur analytic Courses	The students possess advanced knowledge regarding the structure, architecture and control mechanisms of mo- dern communication systems and are able to apply it to evaluate systems and protocols within simulations and measurement setups. In addition, students have gathered insights of the basic methodologies in the field of analytical performance evaluation.						
V (4) + Ü	Ü (2)						
Method module is	l of ass	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus							
Allocation of places							
Additional information							
Workload							
240 h							
Teaching cycle							
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			

Module title					Abbreviation	
Practical course in software					10-l-SWP-152-m01	
Module coordinator				Module offered by		
Dean of Studies Informatik (Computer Scienc			Science)	Institute of Computer Science		
ECTS	ECTS Method of grading Only after succ. co			pl. of module(s)		
10	IO (not) successfully completed 10-I-PP, 10-I-ST					
Duratio	n	Module level	Other prerequisites			
1 semester		undergraduate	In addition, the knowledge and skills acquired in module 10-I-ADS are required. Prior attendance of this module is therefore highly recommended.			
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	elopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)						
practical project (Completion of a larger software project in groups (approx. 300 hours per person) and final pre- sentation (approx. 10 minutes per group)						
Allocation of places						
Additional information						
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 69 Nr. 1 d)						



Summer Term 2020

(ECTS credits)

Module title Abbreviation					
Practical course in software					10-l-SWP-152-m01
Module coordinator				Module offered by	
Dean of Studies Informatik (Computer S			Science)	ience) Institute of Computer Science	
ECTS	ECTS Method of grading Only after succ. co			pl. of module(s)	
10	(not) s	ot) successfully completed 10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	In addition, the knowledge and skills acquired in module 10-I-ADS are required. Prior attendance of this module is therefore highly recommended.		
Conten	ts				
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-
Intende	ed learr	ning outcomes			
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (6)					
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
practical project (Completion of a larger software project in groups (approx. 300 hours per person) and final pre- sentation (approx. 10 minutes per group)					
Allocation of places					
Additional information					
Workload					
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 69 Nr. 1 d)					

Module title					Abbreviation	
Control Principles of Modern Communication Systems					10-l-SKS-191-m01	
Module coordinator				Module offered by		
holder of the Chair of Computer Science III			e III	Institute of Computer Science		
ECTS Method of grading			Only after succ. compl. of module(s)			
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester undergraduate						
Content	ts					
• M • B • M • H • C • S • C	 Control Mechanisms of Modern Communication Systems Multimedia Networking Broadband Access Networks Mobile Communication Systems Home Access Networks Current trends such as Internet of Things (IoT) Software Defined Networking (SDN) Control mechanisms implemented and deployed on the Internet 					
Intende	d learn	ning outcomes				
The students possess advanced knowledge regarding the structure, architecture and control mechanisms of mo- dern communication systems and are able to apply it to evaluate systems and protocols within simulations and measurement setups. In addition, students have gathered insights of the basic methodologies in the field of analytical performance evaluation.						
V (4) + Ü	Ü(2)	,				
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)						
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus						
Allocation of places						
Additional information						
Workload						
240 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module title					Abbreviation	
Seminar - Selected Topics in Computer Science 2 10-I-S					10-I-SEM2-152-m01	
Module coordinator				Module offered by		
Dean of Studies Informatik (Computer Science)				Institute of Comput	er Science	
ECTS	ECTS Method of grading Only after succ. compl.			pl. of module(s)	ol. of module(s)	
5	numerical grade					
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-up report on tutoring activities (5 to 10 pages) Language of assessment: German and/or English						
Allocation of places						
Additional information						
Workload						
150 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module title Abbreviation					
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Semina	ır - Sele	ected Topics in Computer	Science 1		10-I-SEM1-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 Ferent lecturers).	ure and, where applicable, soft- -I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	n (approx. 30 to 45 i	ninutes) with subsequent dis-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 Nr. 3 b)						

Module	Module title Abbreviation				
Project	Project Presentation				10-I-PV-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.
Intende	ed learr	ning outcomes			
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (5)					
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)
Allocat	ion of p	olaces			
Additional information					
Workload					
150 h					
Teachir	Teaching cycle				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	Vr. 3 b)				

Module	Module title Abbreviation					
Practical Course in Programming 10-I-PP-					10-l-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 Sem	nester	undergraduate	Intended learning of GdP. It is therefore s	utcomes of the follow strongly recommende	wing module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of si	nall to middle-sized	, high-quality Java programs.	
Intende	ed leari	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes	al exan s)	nination (programming e>	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120	
lf annou examin prox. 15	unced l ation o 5 minut	by the lecturer at the beg if one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	lr. 1 c)					
§ 69 Nr. 1 d)						

Module title					Abbreviation	
IT Security					10-l-SEC-191-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 Till (ł N S re P ci 	heoreti nistoric es, pul etwork oftwar everse latform urity m	ical aspects: information- cal and modern ciphers, h blic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co ash functions, pseuc ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors iti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed lear	ning outcomes				
Studen and and going to exercise	ts will l alyze s o unde es prov S (type r	be introduced to the main ecurity of a system critica rstand the purpose and fiv ride some hands-on exper- number of weekly contact hours.	n concepts and abstra Illy from the attacker unction of several sec rience of security flow anguage — if other than Ger	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
V (2) +	Ü (2)					
Module	e taugh	t in: German and/or Engl	ish			
Methoo module is	l of ass creditab	Sessment (type, scope, langua Ile for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English					
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h	150 h					
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Practication of mathematication of the structure of the struct	Module title Abbreviation					Abbreviation	
Module offered byDealInstitute of Computer ScienceECTSM=ture StratementInstitute of Computer ScienceInstitute of Computer ScienceECTSM=due IeelOnly after succ. completionDurativeModule IeelOnly after succ. completionDurativeModule IeelOnly after succ. completion1 semestriModule IeelOnly after succ. completionPractical regionModule IeelOnly after succ. completionContestricIndegraduateInterprequisitesFractical regionInterprequisitesInterprequisitesFractical regionInterprequisitesInterprequisitesInterprecuisiteInterprecuisitesInterprecuisitesFractical regionInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInterprecuisitesInt	Practical course in hardware					10-l-HWP-152-m01	
Dear Studies Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) in (not) successfully completed	Module	coord	inator		Module offered by		
ECTSMete or gradingOnly after succ. compl. of module(s)10(not) successfully completedDurationModule levelOther prerequisites1 sem sterundergraduateContentsTractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complet microprocessor.Intended terming outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Courses (type, number of weekly contact hours, language – if other than German)P (6)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)Additional informationCourses to induce is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 20 hours total)<	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
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Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	P (6)						
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Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
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Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22	Vr. 3 b)					

Module title					Abbreviation	
Advanced Programming					10-I-APR-172-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
grams. and coo de a se cussed	lf more de dup nsible	complex problems are to licates occur. In this lectu structure. Also, further to	b be tackled, subopti re, further knowledg pics in the areas of s	mal results like long e is to be conveyed o oftware security and	incomprehensible functions on how to give programs and co- parallel programming are dis-	
Intende	ed leari	ning outcomes				
Studen then im allel pro sing.	ts learr pleme ocessir	a advanced programming nted in multiple language og concepts are introduce	paradigms especiall es and their efficiency ed culminating in the	y suited for space ap y measured using sta use of GPU architect	oplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
V(2) +	ü (2)			inany		
Methoo module is	of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examinunced ation o minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, prox. 20 minutes) or ′or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Module	Module title Abbreviation					
Selecte	d Basi	cs of Computer Science			10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module title Abbreviation					Abbreviation	
Algorithmic Graph Theory 10-I-AGT-152-m01					10-I-AGT-152-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
colourin of graph program	ngs, wo h probl ns or h ed learn	ork with planar graphs an lems, we also become far ow we show that they are ning outcomes	d find out how the ra niliar with new conce fixed parameter con	nking algorithm of G epts, for example how nputable.	ioogle works. Using the examples w we model problems as linear	
The stu cipants course,	dents a are ab stude	are able to model typical le to decide which tool fr nts learn in detail how to	problems in compute om the course helps estimate the run time	er science as graph p solve a given graph e of given graph algo	problems. In addition, the parti- problem algorithmically. In this prithms.	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	Ü (2)					
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examin unced l ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	§ 22 II Nr. 3 b)					



Winter Term 2020

(ECTS credits)

Module title Abbreviation					Abbreviation
Algorithmic Graph Theory 10-I-AGT-152-m01					10-l-AGT-152-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
colourin of grap prograr Intende The stu cipants	ngs, wo h probl ns or h ed lear dents a are ab	ork with planar graphs an lems, we also become far ow we show that they are ning outcomes are able to model typical ole to decide which tool fr	d find out how the ra niliar with new conce fixed parameter con problems in compute om the course helps	nking algorithm of G epts, for example hov nputable. er science as graph p solve a given graph	boogle works. Using the examples w we model problems as linear problems. In addition, the parti- problem algorithmically. In this
course,	stude	nts learn in detail how to	estimate the run time	e of given graph algo	prithms.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	U (2)	••			
module is	creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
written If annou examin prox. 15 Langua credital	examin unced ation c 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, prox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of _l	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	§ 22 II Nr. 3 b)				

Module	Module title Abbreviation					
Selecte	d Basi	cs of Computer Science			10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Advanc	ced Pro	gramming			10-I-APR-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Its					
grams. and co de a se cussed	lf more de dup ensible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	mal results like long e is to be conveyed oftware security and	, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	its learr ipleme ocessir	n advanced programming nted in multiple language ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space a y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	U (2)	•••				
module is	d of ass s creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
written If anno examin prox. 19 Langua credita	examin unced nation o 5 minut age of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachi	Teaching cycle					
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Practication of mathematication of the structure of the struct	Module title Abbreviation					Abbreviation	
Module offered byDealInstitute of Computer ScienceECTSM=ture StratementInstitute of Computer ScienceInstitute of Computer ScienceECTSM=due IeelOnly after succ. completionDurativeModule IeelOnly after succ. completionDurativeModule IeelOnly after succ. completion1 semestriModule IeelOnly after succ. completionPractical regionModule IeelOnly after succ. completionContestricIndegraduate	Practical course in hardware					10-l-HWP-152-m01	
Dear Studies Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) in (not) successfully completed	Module	coord	inator		Module offered by		
ECTSMete or gradingOnly after succ. compl. of module(s)10(not) successfully completedDurationModule levelOther prerequisites1 sem sterundergraduateContentsTractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complet microprocessor.Intended terming outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Courses (type, number of weekly contact hours, language – if other than German)P (6)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)Additional informationCourses to induce is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 20 hours total)<	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
10 (not) successfully completed Duration Module level Other prerequisites 1 sem ster undergraduate Contents Fractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Module is creditable for bonus) Information of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Yorkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) S 22 II Nr. 3 b)	10	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places	Duratio	n	Module level	Other prerequisites			
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Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts					
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Intende	ed learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	/ review, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	P (6)						
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
 Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additio	nal info	ormation				
Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22	Vr. 3 b)					

Module title				Abbreviation		
IT Secu	rity				10-l-SEC-191-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 Till (ł N S re P ci 	heoreti nistoric es, pul etwork oftwar everse latform urity m	ical aspects: information- cal and modern ciphers, h blic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co ash functions, pseuc ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors iti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed lear	ning outcomes				
Studen and and going to exercise	ts will l alyze s o unde es prov S (type r	be introduced to the main ecurity of a system critica rstand the purpose and fiv ride some hands-on expenses	n concepts and abstra Illy from the attacker unction of several sec rience of security flow anguage — if other than Ger	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
V (2) +	Ü (2)					
Module	e taugh	t in: German and/or Engl	ish			
Methoo module is	l of ass creditab	Sessment (type, scope, langua Ile for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	examin unced ation c minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Worklo	Workload					
150 h	150 h					
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Aerosp	ace Lal	ooratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air ai mechai	sensor segme nd spae nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions of air constructions) of air construction	on) of a satellite moc ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems ire, hardware, electronics and	
Intende	ed learı	ning outcomes				
electron a devel mentat del.	nics an lopmen ion (so	d mechanics by themsel t will be tested: capture ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ice, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hours	s each)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
180 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module title					Abbreviation	
Practical work Space Technology					10-I-PLR-172-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
120 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Practical Course in Programming 10-I-PP-191-m01					10-l-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 Sem	nester	undergraduate	Intended learning of GdP. It is therefore s	utcomes of the follow strongly recommende	wing module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of si	nall to middle-sized	, high-quality Java programs.	
Intende	ed leari	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes	al exan s)	nination (programming e>	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120	
lf annou examin prox. 15	unced l ation o 5 minut	by the lecturer at the beg if one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	lr. 1 c)					
§ 69 Nr. 1 d)						

Project version of the degradance of	Module	Module title Abbreviation				
Modu e or subsectionModu of Greed byBearInstitute of Computer ScienceSetInstitute of Computer ScienceSoInstitute of Computer ScienceSoInstitute of Computer ScienceSoInstitute of Computer ScienceSoIndergraduate	Project Presentation 10-I-PV-152-r					10-I-PV-152-m01
Deserve two serverses informatik (Computer Science) Institute of Computer Science ECT Medue level Other prerequisites 1 sem set informative (Computer Science) Module level Other prerequisites 1 sem set informative (Computer Science) Institute of Computer Science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers with a knowledge of computer science at a trade fair. The project, which may also be work-in-travers are able to present at project developed by the candidate and optionally a live demonstration. S (s) Image: State St	Module	coord	inator		Module offered by	
ECT: Project for gradingOnly after succ. compl. of module(s)5numerial gradeDurationModule levelOther prerequisites1 semerialundergraduateConcenterForegradiateConcenterForegradiatePresentation of project developed by the student (e.g. schedor's thesis, software project, which may also be group the science at a trade fair. The project, which may also be group the science at a trade fair. The project, which may also be group the science at a trade fair. The project, which may also be group the science at a trade fair. The project, which may also be group the science at a trade fair. The project, which may also be group the science at a trade fair. The project, which may also be group the science at a trade fair. The project, which may also be group to a poster, a short talk and optionally a live demonstration.S (Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science
5num.Bodale levelOther prequisites1 sem indegraduate1 sem undegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateContertindegraduateCo	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
DurationModule levelOther prerequisites1 semesterundergraduate1 semesterundergraduateContentsPresentation for a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for a presented with a knowledge of computer science at a trade fair. The project, which may also be grown's-in-project, sis presented with a knowledge of computer science at a trade fair. The project, which may also be grown's in prosent a with a knowledge of computer science at a trade fair. The project, which may also be grown's in project developed and to create the required media.Courses (type, unber of weekly contact hours, language – if other than German)S (s)Method of subject (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditar's related fair - if well as discussion (approx. 10 to 15 minutes total)Presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair - well as discussion (approx. 10 to 15 minutes total)Additional informationTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustionTerustion<	5	nume	rical grade			
1 semester undergraduate Contents Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (s) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Presentation of a project developed by by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Allocation of places Faching cycle	Duratio	n	Module level	Other prerequisites		
Contents Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) anguage of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	1 seme	ster	undergraduate			
Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge g of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Hortkoad 150 h Teaching cycle Referred to in LPOI (examination regulations for teaching-degree programmes) § 22 ll Nr. 3 b)	Conten	ts				
Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled-ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Yorkload 150 h Teaching cycle Referred to in LPO1 (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.
The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO1 (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Intende	ed learn	ning outcomes			
Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.
S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled-ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	S (5)					
presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)
 Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces			
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
 Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additio	nal info	ormation			
Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Nr. 3 b)	Worklo	ad				
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	150 h					
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)						
§ 22 II Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
	§ 22	Nr. 3 b)				

Module	Module title Abbreviation					
Semina	ır - Sele	ected Topics in Computer	Science 1		10-I-SEM1-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 rerent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Method module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussion Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	n (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h	150 h					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 Nr. 3 b)						

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learn	ning outcomes				
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-u Langua	p repoi ge of a	t on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal infe	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practica	al cour	se in software			10-l-SWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in ; p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§691N	§ 69 Nr. 1 d)					

Module title Abbreviation					Abbreviation	
Control	Princi	ples of Modern Communi	cation Systems		10-l-SKS-191-m01	
Module	coord	inator		Module offered by		
holder	of the O	Chair of Computer Scienc	e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
• C • M • H • C • S • C	ontrol lultime roadba lobile (ome A urrent oftware oftware ontrol	Mechanisms of Modern C dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente tion of analytical perform	ommunication Syste f Things (IoT) N) ed and deployed on the nance evaluation	ms ne Internet		
Intende	d learr	ning outcomes				
The stur dern co measur analytic Courses	dents p mmuni ement cal perf s (type, n	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation. umber of weekly contact hours, l	edge regarding the st able to apply it to eva ents have gathered i 	ructure, architecture luate systems and p nsights of the basic 	e and control mechanisms of mo- protocols within simulations and methodologies in the field of	
V (4) + ĺ	Ü (2)					
Method module is	l of ass	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	Workload					
240 h	240 h					
Teachin	ig cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		



Summer Term 2021

(ECTS credits)

Module title					Abbreviation
Algorithmic Graph Theory 10-I-AGT-152-m01					10-I-AGT-152-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable. Intended learning outcomes The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms. Courses (type, number of weekly contact hours, language – if other than German) V (2) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-					
Langua credital	ge of a ble for	ssessment: German and/ bonus	or English		
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	§ 22 II Nr. 3 b)				

Module	Module title Abbreviation					
Selecte	Selected Basics of Computer Science				10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Advanc	Advanced Programming 10-I-APR-172-m01					
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Its					
grams. and co de a se cussed	lf more de dup ensible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	mal results like long e is to be conveyed oftware security and	, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	its learr ipleme ocessir	n advanced programming nted in multiple language ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space a y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	U (2)	•••				
module is	d of ass s creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
written If anno examin prox. 19 Langua credita	examin unced nation o 5 minut age of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	Additional information					
Workload						
150 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Practi course in hardware 10-I-HWP-152-m01 Module correction Module offered by Dean of Studies Informatik (Computer Science) Institute of Computer Science ECTS Met+of grading Only after succ. com-L. of module(s) 10 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Practical superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete Practical superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete Intended bear Soft accomplete Practical superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete Intended bear The stude superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete Intended bear The stude superiments on independent pervise, prepare and perform experiments with the help of experiment descriptions, to independent pervise, prepare and perform superiments as well as to document and evaluate experiment of accomplete superiment as well as to document and evaluate experiment asperiment as to document as well as to docume	Module	Module title Abbreviation					
Module correction Module offered by Dean → Function Institute of Computer Science ECTS Method f grading Only after succ. complete(s) 10 (not) → cossfully completed Duration Module level Other prerequisites 1 sem → r Module level Other prerequisites 1 sem → r undergraduate Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended by Intended by Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended by Intended by The sture is able to independently search for additional information as well as to document and evaluate experiment descriptions, to independently search for additional information as well as to document and evaluate experiment and evaluate experiment and evaluate experiment description and evaluate experiment and evaluate experiment and evaluate experiment and evaluate experiment description and evaluate experiment evaluate experiment eva	Practica	al cour	se in hardware		10-l-HWP-152-m01		
Dean of Studies Informatik (Computer Science) Institute of Computer Science ECTS Met→ of grading Only after succ. compl. of module(s) 10 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes Intendent learning outcomes The students are able to independently search for additional information as well as to document and evaluate experiment are speciment of a complet or additional information as well as to document and evaluate experiment	Module	coord	inator		Module offered by		
ECTS Met→ of grading Only after succ. compl. of module(s) 10 (not) Juccessfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Fractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learting outcomes Fractical experiments on independently search for additional information as well as to document and evaluate experiment descriptions, to independently search for additional information as well as to document and evaluate experiment evaluate experiment evaluate evaluate experiment evaluate ev	Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
10 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment recently	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
DurationModule levelOther prerequisites1 semesterundergraduateContentsPractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor.Intended learning outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment	10	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment receiver.	Duratio	n	Module level	Other prerequisites			
Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment experiment	1 semes	ster	undergraduate				
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.	Conten	ts					
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment	Intende	ed learr	ning outcomes				
	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	<i>r</i> eview, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
Courses (type, number of weekly contact hours, language $-$ if other than German)	Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)	P (6)						
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)	Method module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)	portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Allocation of places	Allocat	ion of p	olaces				
Additional information	Additio	nal info	ormation				
Workload							
300 h							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)	Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
§ 22 II Nr. 3 b)	§ 22 N	vr. 3 b)					

Module title					Abbreviation	
IT Security					10-l-SEC-191-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e II	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Contents						
 Till (ł N S re P ci 	 The course provides a broad sweep through concepts and technologies related to IT security: Theoretical aspects: information-theoretic security, computational security, introduction to cryptography (historical and modern ciphers, hash functions, pseudo-random generators, message authentication co-des, public key cryptography) Network security: protocol security, security of TCP/IP, public key infrastructure, user authentication Software security: Software vulnerabilities, common programming errors and exploitation techniques, reverse engineering and obfuscation, malware and anti-malware Platform security: access control models, security policies, operating system security, virtualization, se- 					
Intende	ed lear	ning outcomes				
Students will be introduced to the main concepts and abstractions of IT security. They learn how to model threats and analyze security of a system critically from the attacker view point. After visiting the lecture students are going to understand the purpose and function of several security technologies, as well as their limitations. The exercises provide some hands-on experience of security flows in software.						
V(2) +	з (туре, т					
Module	e taugh	t in: German and/or Engl	ish			
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus						
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation						
Aerosp	ace Lat	ooratory			10-I-LRLA-172-m01		
Module	e coord	inator		Module offered by			
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
6	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
stems, ground of air ai mechai	sensor segme nd spac nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions and systems of air omplex development onents.	on) of a satellite moc ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems ire, hardware, electronics and		
Intende	ed learr	ning outcomes					
electron a devel mentat del.	nics an opmen ion (so	d mechanics by themsel t will be tested: capture ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ice, transfer to the successor mo-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)			
V (2) +	P (2)						
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
Comple	etion of	approx. 6 practical exerc	cises (approx. 4 hours	s each)			
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
180 h							
Teaching cycle							
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)			

Practic Less usement and Control System Engineering 10-1-HMR-152-m01 Module of fered by Module offered by Institute of Computer Science Institute of Computer Science Bat Motion Stresson Bat Module evel Only after succ. of module(s) S Module level Other prerequisites Duration Module level Other prerequisites 1 sem ster undergraduate Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controlies or aerospace information technology. Intended of assessment (type, number of weekly contact hours, language – if other than Geman, examination offered – if not rever semester, information on whether module is creditable for bonus) Project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocations in transionary Additionary Addit Addit Start Start Start Intended of assessment (type, scope, language – if other than Geman, examination offered – if not starts pages) Addit Addit Addit Star	Module title Abbreviation							
Module coordinator Module offered by holder of the Chair of Computer Science VI Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 8 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Addictional information 240 h	Practical Measurement and Control System Engineering 10-I-HMR-152-mo1							
hole Far of yarding Only after succ. compl. of module(s) 8 (not) successfully completed	Module	coord	inator		Module offered by			
ECTS Met→ grading Only after succ. compl. of module(s) 8 noi > ucessfully completed Duration Module level Other prerequisites 1 sem stress undergraduate Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intervent set of boots or aerospace information technology. Intervent vert vert vert vert vert vert vert ver	holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science		
8 (not) successfully completed Module level Other prerequisites 1 sem ster undergraduate 1 sem ster undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended lear-imp outcomes Students understand closed loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Additional formation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of placestimut of second loop systems and set colspan="2">Contestimut of	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical expriments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places 4dditional information 240 h Referred to in LPO I (examination regulations for teaching-degree programmes) <t< td=""><td>8</td><td>(not) s</td><td>successfully completed</td><td></td><td></td><td></td></t<>	8	(not) s	successfully completed					
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Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	1 seme	ster	undergraduate					
Practical experiments of control aspects (hardware and software), for example implementation of linear and non- linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Conten	ts						
Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language if other than German) P (6) Method of assessment (type, scope, language if other than German, examination offered if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Yorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in nology.	mplementation of linear and non-		
Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Yorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Intende	ed learr	ning outcomes					
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.		
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	P (6)							
project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	project	with p	resentation (approx. 15 m	ninutes) and written e	laboration (approx.	12 to 15 pages)		
Additional information Additional information Vorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Allocat	ion of p	olaces					
Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)								
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Additio	nal info	ormation					
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)								
240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Workload							
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	240 h							
Referred to in LPO I (examination regulations for teaching-degree programmes)	Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)								
	Referred to in LPO I (examination regulations for teaching-degree programmes)							

Module title					Abbreviation	
Practical work Space Technology					10-I-PLR-172-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
120 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practical Course in Programming					10-I-PP-191-m01	
Module	Module coordinator			Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	lester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120	
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	r. 1 c)					
§ 69 Nr. 1 d)						

Module title A					Abbreviation	
Project	Preser	itation			10-I-PV-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, soft nce at a trade fair. T hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.	
Intende	ed learn	ning outcomes				
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (5)						
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	Vr. 3 b)					

Module	Module title Abbreviation					
Seminar - Selected Topics in Computer Science 1					10-I-SEM1-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	on (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 Nr. 3 b)						

Module	Module title Abbreviation						
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01						
Module	coord	inator		Module offered by			
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-		
Intende	ed leari	ning outcomes					
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S (2)							
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Wrap-u Langua	p repoi ge of a	rt on tutoring activities (5 ssessment: German and,	to 10 pages) /or English				
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
150 h							
Teaching cycle							
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)			

Module	Module title Abbreviation					
Practic	al cour	se in software			10-l-SWP-152-m01	
Module	e coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation of tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ι are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in g p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additional information						
Workload						
300 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§691N	lr. 1 d)					
Module title					Abbreviation	
-----------------------------------------------------------------	--------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------	--
Control	Princi	ples of Modern Communi	cation Systems		10-I-SKS-191-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Content	ts					
• X • B • H • C • S • C	ontrol lultime roadba lobile (ome A urrent oftware oftware ontrol	Mechanisms of Modern C dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente tion of analytical perform	f Things (IoT) N) and deployed on the state of the second	ne Internet		
Intende	d lear	ning outcomes				
The stur dern co measur analytic Courses	dents p mmuni ement cal perf 6 (type, n	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered in anguage — if other than Ger	ructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of	
V (4) + Ü	Ü(2)	,				
Method module is	l of ass	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
240 h	240 h					
Teachin	ig cycl	9				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		



Winter Term 2021

(ECTS credits)

Module title Abbreviation					Abbreviation	
Algorit	hmic G	raph Theory		10-l-AGT-152-m01		
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
of graph program Intende The stu cipants course, V (2) + 1 Methoc module is written If annot examin prox. 15 Langua credital	We discuss typical graph problems: we solve found thip problems, calculate maximat hows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable. Intended learning outcomes The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms. Courses (type, number of weekly contact hours, language – if other than German) $V(2) + U(2)$ Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English					
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	§ 22 Nr. 3 b)					

Module	Module title Abbreviation					
Selecte	Selected Basics of Computer Science				10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Advanc	ed Pro	gramming			10-I-APR-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
grams. and coo de a se cussed	If more de dup nsible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	e is to be conveyed offware security and	r, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	ts learr pleme ocessir	n advanced programming nted in multiple languag ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space ap y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +						
module is	s creditab	le for bonus)	ge — If other than German, (examination offered — if no	ot every semester, information on whether	
written If anno examin prox. 19 Langua credita	examin unced nation o 5 minut uge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg If one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachi	Teaching cycle					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Module	Module title Abbreviation					
Practical course in hardware 10-I-HWP-152-m01					10-l-HWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer :	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
Intende	ed learr	ning outcomes				
The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	<i>r</i> eview, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22 N	Vr. 3 b)					

Module title					Abbreviation	
IT Secu	rity				10-l-SEC-191-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 Till (ł d N S re P c 	heoreti historic es, pul letwork oftware everse latform urity m	ical aspects: information- cal and modern ciphers, h olic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co bash functions, pseud ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors ti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed learı	ning outcomes				
Studen and and going to exercise	ts will I alyze s o unde es prov	be introduced to the main ecurity of a system critica rstand the purpose and fi vide some hands-on expe	n concepts and abstra ally from the attacker unction of several sec erience of security floo	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + I Module	Ü (2) taugh	t in: German and/or Engl	ish			
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annoi examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Aerosp	ace Lal	ooratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air ai mechai	sensor segme nd spae nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions and systems of air omplex development onents.	on) of a satellite moc ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems ire, hardware, electronics and	
Intende	ed learı	ning outcomes				
electron a devel mentat del.	nics an lopmen ion (so	d mechanics by themsel t will be tested: capture ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ice, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hours	s each)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
180 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Practic L we surface and Control System Engineering 10-1-HMR-152-m01 Module of fered by Institute of Computer Science Institute of Computer Science Reffered by Grading Only after succ. or module(s) 8 (not) successfully completed Duration Module level Other prerequisites Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controlies or aerospace information technology. Intervention of the set of t	Module	Module title Abbreviation					
Module coordinator Module offered by holder of the Chair of Computer Science VI Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 8 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Addictional information 240 h	Practical Measurement and Control System Engineering 10-I-HMR-152-m01					10-I-HMR-152-m01	
hole Far of yarding Only after succ. compl. of module(s) 8 (not) successfully completed	Module	coord	inator		Module offered by		
ECTS Met→ grading Only after succ. compl. of module(s) 8 noi > ucessfully completed Duration Module level Other prerequisites 1 sem stress undergraduate Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intervent set of boots or aerospace information technology. Intervent vert vert vert vert vert vert vert ver	holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science	
8 (not) successfully completed Module level Other prerequisites 1 sem ster undergraduate 1 sem ster undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended lear-imp outcomes Students understand closed loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Additional formation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation formation Contestimut of s	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical expriments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places 4dditional information 240 h Referred to in LPO I (examination regulations for teaching-degree programmes) <t< td=""><td>8</td><td>(not) s</td><td>successfully completed</td><td></td><td></td><td></td></t<>	8	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non- linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Duratio	n	Module level	Other prerequisites			
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Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language if other than German) P (6) Method of assessment (type, scope, language if other than German, examination offered if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Yorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in iology.	mplementation of linear and non-	
Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Yorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Intende	ed learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.	
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	P (6)						
project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	project	with p	resentation (approx. 15 m	ninutes) and written e	laboration (approx.	12 to 15 pages)	
Additional information Additional information Vorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Allocat	ion of p	olaces				
Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)							
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Additio	nal info	ormation				
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)							
240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Worklo	ad					
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	240 h						
Referred to in LPO I (examination regulations for teaching-degree programmes)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module title Abbreviation					Abbreviation	
Practical work Space Technology					10-I-PLR-172-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
120 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Practical Course in Programming					10-I-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	nester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120	
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	lr. 1 c)					
§ 69 l Nr. 1 d)						

Module	Module title Abbreviation						
Project	Project Presentation				10-I-PV-152-m01		
Module	coord	inator		Module offered by			
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.		
Intende	ed learr	ning outcomes					
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S (5)							
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)		
Allocat	ion of p	olaces					
Additio	nal info	ormation					
Workload							
150 h							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 22	Vr. 3 b)						

Module	Module title Abbreviation					
Semina	ır - Sele	ected Topics in Computer	Science 1		10-I-SEM1-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 rerent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Method module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussion Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	n (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h	150 h					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 N	§ 22 Nr. 3 b)					

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learn	ning outcomes				
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-u Langua	p repoi ge of a	t on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal infe	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practica	al cour	se in software			10-l-SWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in ; p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§691N	lr. 1 d)					

Module title					Abbreviation
Control	Princi	ples of Modern Communi	cation Systems		10-I-SKS-191-m01
Module	coord	inator		Module offered by	
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
8	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Content	ts				
• M • B • M • H • C • S • C	Iultime roadba lobile (ome Ad urrent oftware ontrol	dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente tion of analytical perform	f Things (IoT) N) and deployed on the state of the second se	ne Internet	
Intende	d learr	ning outcomes			
The stur dern co measur analytic	dents p mmuni ement cal perf	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered i	ructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of
	(type, n	umber of weekly contact hours, is	anguage — If other than Ger	iiidii)	
Method module is	l of ass creditab	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	Workload				
240 h	240 h				
Teachin	ig cycl	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	



Summer Term 2022

(ECTS credits)

Module title					Abbreviation
Algorithmic Graph Theory					10-I-AGT-152-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable. Intended learning outcomes The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms. Courses (type, number of weekly contact hours, language – if other than German) V (2) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-					
Langua credital	ge of a ble for	ssessment: German and/ bonus	or English		
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	vr. 3 b)				

Module	Module title Abbreviation					
Selecte	d Basi	cs of Computer Science			10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module title					Abbreviation	
Advanced Programming					10-I-APR-172-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
grams. and coo de a se cussed	lf more de dup nsible	complex problems are to licates occur. In this lectu structure. Also, further to	b be tackled, subopti re, further knowledg pics in the areas of s	mal results like long e is to be conveyed o oftware security and	incomprehensible functions on how to give programs and co- parallel programming are dis-	
Intende	ed leari	ning outcomes				
Studen then im allel pro sing.	ts learr pleme ocessir	a advanced programming nted in multiple language og concepts are introduce	paradigms especiall es and their efficiency ed culminating in the	y suited for space a y measured using sta use of GPU architect	oplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
V(2) +	ü (2)			inany		
Methoo module is	of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examinunced ation o minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, prox. 20 minutes) or ′or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	Additional information					
Workload						
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	§ 22 II Nr. 3 b)					

Module	Module title Abbreviation					
Practical course in hardware 10-I-HWP-1					10-l-HWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer :	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
Intende	ed learr	ning outcomes				
The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	<i>r</i> eview, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22 N	Vr. 3 b)					

Module title					Abbreviation
IT Secu	rity				10-l-SEC-191-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
 Till (ł N S re P ci 	heoreti nistoric es, pul etwork oftwar everse latform urity m	ical aspects: information- cal and modern ciphers, h blic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co ash functions, pseuc ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors iti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-
Intende	ed lear	ning outcomes			
Studen and and going to exercise	ts will l alyze s o unde es prov S (type r	be introduced to the main ecurity of a system critica rstand the purpose and fiv ride some hands-on expenses	n concepts and abstra Illy from the attacker unction of several sec rience of security flow anguage — if other than Ger	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The
V (2) +	Ü (2)				
Module	e taugh	t in: German and/or Engl	ish		
Methoo module is	l of ass creditab	Sessment (type, scope, langua Ile for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
written If annou examin prox. 15 Langua credital	examin unced ation c minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of p	olaces			
Additional information					
Worklo	Workload				
150 h	150 h				
Teachir	Teaching cycle				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	

Module	Module title Abbreviation				
Aerosp	ace Lal	boratory			10-I-LRLA-172-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
6	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
stems, ground of air ar mechar	sensor segme nd spae nics. Se	ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (construction nts and systems of ai pomplex development onents.	on) of a satellite moc ir and space flight, s consisting of softwa	fel/simulator, construction of a tructure of simplified subsystems re, hardware, electronics and
Intende	ed learı	ning outcomes			
electron a devel mentati del.	nics an opmen ion (so	d mechanics by themselv t will be tested: capture of ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, deta spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ce, transfer to the successor mo-
Courses	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V (2) + Method	P (2) d of ass	essment (type, scope, langua	ge — if other than German, e	examination offered — if no	t every semester, information on whether
module is	creditab	le for bonus)			
Comple	etion of	approx. 6 practical exerc	cises (approx. 4 hours	s each)	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
180 h					
Referre	Referred to in LPO L (avamination regulations for teaching degree programmes)				

Practic L we surface and Control System Engineering 10-1-HMR-152-m01 Module of fered by Institute of Computer Science Institute of Computer Science Reffered by Grading Only after succ. or module(s) 8 (not) successfully completed Duration Module level Other prerequisites Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controlies or aerospace information technology. Intervention of the set of t	Module title Abbreviation							
Module coordinator Module offered by holder of the Chair of Computer Science VI Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 8 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Addictional information 240 h	Practical Measurement and Control System Engineering 10-I-HMR-152-m01					10-I-HMR-152-m01		
hole Far of yarding Only after succ. compl. of module(s) 8 (not) successfully completed	Module	coord	inator		Module offered by			
ECTS Met→ grading Only after succ. compl. of module(s) 8 noi > ucessfully completed Duration Module level Other prerequisites 1 sem stress undergraduate Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intervent set of boots or aerospace information technology. Intervent set of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intervent set of boots or aerospace information technology. Intervent set of boots stresset of boots set of boots. Intervent set of boots set of boots. P (6) stresset of boots. stresset of boots. Intervent set of boots. P roject with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Intervent set of boots. Intervent set of boots. Additional information stresset of set of boots. Intervent set of boots. Intervent set of boots. 2q.0 h stresset of set of boots. stresset of set of boots. Intervent set of set of boots. 2q.0 h <	holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science		
8 (not) successfully completed Module level Other prerequisites 1 generation 1 semester undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended lear-imp outcomes Students understand closed loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Contestimut of second loop systems and are able to implement and set controllers. Additional toppox. 15 minutes) and written elaboration (approx. 12 to 15 pages) Additional time test of pages. Contestimut of pages. Contestimut of pages. Contestimation Contestimut	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical expriments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places 4dditional information 240 h Referred to in LPO I (examination regulations for teaching-degree programmes) <t< td=""><td>8</td><td>(not) s</td><td>successfully completed</td><td></td><td></td><td></td></t<>	8	(not) s	successfully completed					
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Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Yorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Intende	ed learr	ning outcomes					
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P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	P (6)							
project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	project	with p	resentation (approx. 15 m	ninutes) and written e	laboration (approx.	12 to 15 pages)		
Additional information Additional information Vorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Allocat	ion of p	olaces					
Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)								
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Additio	nal info	ormation					
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)								
240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Worklo	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	240 h							
Referred to in LPO I (examination regulations for teaching-degree programmes)	Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)								
	Referred to in LPO I (examination regulations for teaching-degree programmes)							

Module title					Abbreviation	
Practical work Space Technology					10-I-PLR-172-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
120 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation				
Practical Course in Programming					10-I-PP-191-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
10	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1-2 sem	nester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.
Conten	ts				
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.
Intende	ed learı	ning outcomes			
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (6)					
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§491N	lr. 1 c)				
§ 69 l Nr. 1 d)					

Project verse	Module	Module title Abbreviation					
Module offered byDealInstitute of Computer ScienceECTSMeture of Computer ScienceFParticleSnumerical gradingDurativeModule levelOther prerequisites0undergraduateContensiteundergraduatePresentation of a project developed by the student (e.g. Bachelor's thesis, software project) analogous to a presentation by presented with the help of a poster, a short talk and optionally a live demonstration.Intervention of a project developed by the student (e.g. Bachelor's thesis, software project, which may also be work-in-project, which may also be grouped from the short talk and optionally a live demonstration.Intervention of a project developed by the student from the short talk and optionally a live demonstration.Intervention of a project developed by the candidate analogous to a presentation of a project developed by the candidate analogous to a presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project student deir as well as discussion (a province) to 15 minutes total)Instruct Science at a trade fair a swell as discussion (a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as discussion (a province) to 15 minutes total)Instruct Science at trade fair as well as discussion or EnglishInstruct Science at tarde fair as discussion or EnglishInstruct Science at tarde fair as discussion (I province) total)Instruct Science at tarde fair as discussion (I province) total)Instruct Science At tarde fair as discussion (I province)	Project Presentation					10-I-PV-152-m01	
Dear Futures Institute of Computer Science ECTS Met→ of grading numerical grade Only after succ. compl. of module(s) 5 numerical grade Duration Module level Other prerequisites 1 semster undergraduate Content Other prerequisites Institute of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intend Earning outcomes Institute of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intend/estation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intend/estation for laypersons with a knowledge of computer science at a trade fair as use also to presentation offered – if not every semester, information on whether module is creditable for bonus) Presentation of a project developed by the candidate analogous to a presentation of r laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. to to 15 minutes total) Language If other than German, examination offered – if not every semester, information on whether module is creditable for bonus)	Module	coord	inator		Module offered by		
ECTSMeter or gradingOnly after succ. compl. of module(s)5numerial gradeDurationModule levelOther prerequisites1 sem sterundergraduateContentsPresentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation or laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended by the student of uspersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended by the student (e.g. Bachelor's thesis, software project) analogous to a presented work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended by the student (e.g. Bachelor's thesis, software project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended by the student (e.g. Bachelor's thesis, software project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intende do a poster, a short talk and optionally a live demonstration.Intende do a poster, a short talk and optionally a live demonstration.Intende do a poster, a short talk and optionally a live demonstration.Intende do a present do present a project developed by the candidate analogous to a presentation for laypersons with a	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
5numerical gradeDurationModule levelOther prerequisites1 sem seriesundergraduateContertCompose of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended territy outcomesThe student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended territy outcomesThe student colspan="2">The student (e.g. Bachelor's thesis, software project) analogous to a presentation of project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.OutcomesMethod territy outcomesIntended territy outcomes <td>ECTS</td> <td>Metho</td> <td>od of grading</td> <td>Only after succ. com</td> <td>pl. of module(s)</td> <td></td>	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate 1 semester undergraduate Contents Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for aypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optically a live demonstration. Intended lear-in-groutcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (s) Method of as-essment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) anguage of as-essment: German et all sciences in a project. Additional information	5	nume	rical grade				
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Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a pre- sentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Morkload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts					
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S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled-ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	S (5)						
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Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)	
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
 Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additional information						
Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	150 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22	§ 22 II Nr. 3 b)					

Module	Module title Abbreviation					
Seminar - Selected Topics in Computer Science 1 10-I-SEM1-152-m01						
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	on (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22 Nr. 3 b)						

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learn	ning outcomes				
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-u Langua	p repoi ge of a	t on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practical course in software					10-l-SWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	velopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in g p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additional information						
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§691N	§ 69 Nr. 1 d)					

Module title					Abbreviation	
Control	Control Principles of Modern Communication Systems				10-l-SKS-191-m01	
Module coordinator				Module offered by		
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Content	ts					
• M • B • M • H • C • S • C	Iultime roadba lobile (ome Ad urrent oftware ontrol	Adia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente ction of analytical perform	f Things (IoT) N) and deployed on the state of the second s	ne Internet		
Intende	d learr	ning outcomes				
The stur dern co measur analytic	dents p mmuni ement al perf	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered i	tructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of	
V(a) + 1	(i) (2)			inany		
Method module is	l of ass creditab	Sessment (type, scope, langua ₎ le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English craditable for bonus					
Allocation of places						
Additional information						
Workload						
240 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					



Winter Term 2022

(ECTS credits)

Module	Module title Abbreviation					
Algorit	Algorithmic Graph Theory 10-I-AGT-152-m01					
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable. Intended learning outcomes The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms. Courses (type, number of weekly contact hours, language – if other than German) V (2) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes).						
credital	ge of a ble for	bonus				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 22	§ 22 II Nr. 3 b)					

Module	Module title Abbreviation					
Selected Basics of Computer Science					10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module	Module title Abbreviation					
Advanced Programming 10-I-APR-172-m01					10-I-APR-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
grams. and coo de a se cussed	If more de dup nsible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	e is to be conveyed offware security and	r, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	ts learr pleme ocessir	n advanced programming nted in multiple languag ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space ap y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +						
module is	s creditab	le for bonus)	ge — If other than German, (examination offered — if no	ot every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus						
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22 Nr. 3 b)						

Practice with a random regulation for the day and the day of the day o	Module	Module title Abbreviation					
Module offered byDealInstitute of Computer ScienceECTSM=ture StrangOnly after succ. complet of Computer ScienceToInstitute of Computer ScienceDurativeScienceDurativeModule levelOnly after succ. completion1 semestriModule levelOnly after succ. completion1 semestriModule levelOnly after succ. completionPractical responsemodure serviceSciencePractical responsemodule responseSciencePractical responsescienceScienceScience responsescienceSciencePractical responsescienceScienceScience responsescienceSciencePractical responsescienceScienceScience responsescienceSciencePractical responsesciencescie	Practical course in hardware					10-l-HWP-152-m01	
Dear of Studies Informatik (Computer Science) Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 10 (not) successfully completed Duration Module level Other prerequisites 1 sem ster undergraduate Conterts Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended teamicroprocessor. Thets students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 400 microprocessor) Additical information "- Additical information regulations for teaching-degree programmes) Soo h "- Additiscreditable for bonus <td>Module</td> <td>coord</td> <td>inator</td> <td></td> <td>Module offered by</td> <td></td>	Module	coord	inator		Module offered by		
ECTSMeter of gradingOnly after succ. compl. of module(s)10(not) successfully completed-DurationModule levelOther prerequisites1 sem successfully completedContentsundergraduateContentsUndergraduateIntended successfully completed in communication technology, robots or the structure of a complet microprocessor.Intended successfully contact hours, for example in communication technology, robots or the structure of a complet microprocessor.Intended successfully contact hours, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Contest successfully contact hours, language – if other than German)Protificition of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 250 hours to	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
10 (not) successfully completed Duration Module level Other prerequisites 1 sem ster undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Module is creditable for bonus) portio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation or results (approx. 350 hours total) and presentation or results (approx. 350 hours total) and presentation or results (approx. 350 hours total) Additional information 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical exp=riments on hardware asp=cets, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of aspectation of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of laces Yorkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 2 1l Nr. 3 b)	10	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places	Duratio	n	Module level	Other prerequisites			
Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Motkload 300 h Teaching cycle Referred to in LPO 1 (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	1 seme	ster	undergraduate				
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts					
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Intende	ed learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	/ review, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	P (6)						
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
 Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additional information						
Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 II Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22	Vr. 3 b)					
Module title				Abbreviation			
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IT Security				10-l-SEC-191-m01			
Module	e coord	inator		Module offered by			
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
 Till (f N S P C Intende Studen and ana 	 The course provides a broad sweep through concepts and technologies related to IT security: Theoretical aspects: information-theoretic security, computational security, introduction to cryptography (historical and modern ciphers, hash functions, pseudo-random generators, message authentication co-des, public key cryptography) Network security: protocol security, security of TCP/IP, public key infrastructure, user authentication Software security: Software vulnerabilities, common programming errors and exploitation techniques, reverse engineering and obfuscation, malware and anti-malware Platform security: access control models, security policies, operating system security, virtualization, security mechanisms with support in hardware Intended learning outcomes Students will be introduced to the main concepts and abstractions of IT security. They learn how to model threats 						
going to exercise	o unde es prov	rstand the purpose and f vide some hands-on expe	unction of several sec rience of security flow	curity technologies, ws in software.	as well as their limitations. The		
Courses	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) + Module	U (2) e taugh	t in: German and/or Engl	ish				
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
written If annot examin prox. 15 Langua credital	examin unced l ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
150 h							
Teachir	ng cycl	e					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			

Module	Module title Abbreviation					
Aerosp	ace Lal	ooratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by	· · · · · · · · · · · · · · · · · · ·	
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air ai mechai	sensor segme nd spae nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions of a construction of a	on) of a satellite moo ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems re, hardware, electronics and	
Intende	ed learı	ning outcomes				
electron a devel mentat del.	nics an Iopmen ion (so	d mechanics by themselv t will be tested: capture o ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ce, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hours	s each)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
180 h						
Teaching cycle						
Referre	a to in	LPU I (examination regulation:	s for teaching-degree progra	mmes)		

Module title Abbreviation					Abbreviation	
Practical Measurement and Control System Engineering 10-I-HMR-152-mo1					10-I-HMR-152-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e VI	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in nology.	mplementation of linear and non-	
Intende	ed learr	ning outcomes				
Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
project	with p	resentation (approx. 15 m	inutes) and written e	laboration (approx.	12 to 15 pages)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
240 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module title				Abbreviation			
Practical work Space Technology					10-I-PLR-172-m01		
Module	e coord	inator		Module offered by			
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
4	(not) s	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Comple	etion of	a practical task.					
Intende	ed lear	ning outcomes					
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.		
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
P (2)							
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work			
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
120 h	120 h						
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module title Abbreviation				Abbreviation			
Practical Course in Programming					10-I-PP-191-m01		
Module	coord	inator		Module offered by			
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
10	(not) s	successfully completed					
Duratio	n	Module level	Other prerequisites				
1-2 sem	nester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.		
Conten	ts						
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.		
Intende	ed learı	ning outcomes					
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.		
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
P (6)							
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120		
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-		
Allocati	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	Workload						
300 h							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
§491N	lr. 1 c)						
§ 69 Nr. 1 d)							

Module title Ab					Abbreviation
Project Presentation					10-I-PV-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.
Intende	ed learr	ning outcomes			
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (5)					
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
present ge of co Langua	tation o ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	Vr. 3 b)				

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 1 10-I-SEM1-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 Ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learı	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	on (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 II Nr. 3 b)						

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o 1. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ure and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-u Langua	p repoi ge of a	t on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practica	al cour	se in software			10-l-SWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in ; p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§691N	lr. 1 d)					

Module title				Abbreviation		
Control Principles of Modern Communication Systems				10-l-SKS-191-m01		
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Content	ts					
• M • B • M • H • C • S • C	Iultime roadba lobile (ome Ad urrent oftware ontrol	dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente tion of analytical perform	f Things (IoT) N) and deployed on the state of the second se	ne Internet		
Intende	d learr	ning outcomes				
The stur dern co measur analytic	dents p mmuni ement cal perf	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered i	ructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of	
	(type, n	umber of weekly contact hours, is	anguage — If other than Ger	iiidii)		
Method module is	l of ass creditab	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
240 h						
Teachin	ig cycl	9				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		



Summer Term 2023

(ECTS credits)

Module title					Abbreviation	
Algorithmic Graph Theory 10-I-AGT-152-m01					10-I-AGT-152-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
colourin of graph program	ngs, wo h probl ns or h ed learn	ork with planar graphs an lems, we also become far ow we show that they are ning outcomes	d find out how the ra niliar with new conce fixed parameter con	nking algorithm of G epts, for example how nputable.	ioogle works. Using the examples w we model problems as linear	
The stu cipants course,	dents a are ab stude	are able to model typical le to decide which tool fr nts learn in detail how to	problems in compute om the course helps estimate the run time	er science as graph p solve a given graph e of given graph algo	problems. In addition, the parti- problem algorithmically. In this prithms.	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	Ü (2)					
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examin unced l ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 22	§ 22 II Nr. 3 b)					

Module	Module title Abbreviation					
Advanced Programming 10-I-APR-172-m01				10-I-APR-172-m01		
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Its					
grams. and co de a se cussed	If more de dup ensible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	mal results like long e is to be conveyed oftware security and	, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	its learr ipleme ocessir	n advanced programming nted in multiple language ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space a y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	U (2)	•••				
module is	d of ass s creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
written If anno examin prox. 19 Langua credita	examin unced nation o 5 minut age of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Workload						
150 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22	Nr. 3 b)					

Module title Abbreviation					Abbreviation	
Selected Basics of Computer Science					10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module title					Abbreviation	
Practical Measurement and Control System Engineering					10-I-HMR-152-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in ology.	nplementation of linear and non-	
Intende	ed learr	ning outcomes				
Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
project	with p	resentation (approx. 15 m	inutes) and written e	laboration (approx.	12 to 15 pages)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
240 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module title Abbreviation					Abbreviation	
Practical course in hardware					10-l-HWP-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer :	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
Intende	ed learr	ning outcomes				
The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	<i>r</i> eview, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22 N	Vr. 3 b)					

Module	Module title Abbreviation					
Aerosp	ace Lal	ooratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by	· · · · · · · · · · · · · · · · · · ·	
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air ai mechai	sensor segme nd spae nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions of a construction of a	on) of a satellite moo ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems re, hardware, electronics and	
Intende	ed learı	ning outcomes				
electron a devel mentat del.	nics an Iopmen ion (so	d mechanics by themselv t will be tested: capture o ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ce, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hours	s each)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
180 h						
Teaching cycle						
Referre	a to in	LPU I (examination regulation:	s for teaching-degree progra	mmes)		

Module title				Abbreviation		
Practical work Space Technology					10-I-PLR-172-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
120 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module title Abbreviation				Abbreviation		
Practical Course in Programming					10-I-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	nester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120	
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§491N	lr. 1 c)					
§ 69 Nr. 1 d)						

Module title					Abbreviation	
Project Presentation					10-I-PV-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.	
Intende	ed learr	ning outcomes				
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (5)						
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
present ge of co Langua	tation o ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	Vr. 3 b)					

Module title				Abbreviation		
IT Security				10-l-SEC-191-m01		
Module coordinator				Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 Till (ł d N S re P c 	heoreti historic es, pul letwork oftware everse latform urity m	ical aspects: information- cal and modern ciphers, h olic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co bash functions, pseud ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors ti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed learı	ning outcomes				
Studen and and going to exercise	ts will I alyze s o unde es prov	be introduced to the main ecurity of a system critica rstand the purpose and fi vide some hands-on expe	n concepts and abstra ally from the attacker unction of several sec erience of security floo	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + I Module	Ü (2) taugh	t in: German and/or Engl	ish			
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annoi examin prox. 15 Langua credital	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English					
Allocat	ion of p	olaces				
Additio	Additional information					
Workload						
150 h	150 h					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module title Abbreviation					Abbreviation
Seminar - Selected Topics in Computer Science 1					10-I-SEM1-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science c n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 Ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-
Intende	ed learr	ning outcomes			
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (2)					
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatic nputer science /or English	on (approx. 30 to 45 i	minutes) with subsequent dis-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teachir	Teaching cycle				
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
§ 22	§ 22 Nr. 3 b)				

Module	Module title Abbreviation					
Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01						
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Wrap-u Langua	p repoi ge of a	rt on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module title				Abbreviation		
Control Principles of Modern Communication Systems			cation Systems		10-l-SKS-191-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Content	ts					
• X • B • H • C • S • C	 Control Mechanisms of Modern Communication Systems Multimedia Networking Broadband Access Networks Mobile Communication Systems Home Access Networks Current trends such as Internet of Things (IoT) Software Defined Networking (SDN) Control mechanisms implemented and deployed on the Internet 					
Intende	d learn	ning outcomes				
The stur dern co measur analytic Courses	dents p mmuni ement cal perf 6 (type, n	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered in anguage — if other than Ger	ructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of	
V (4) + Ü	Ü(2)	,				
Method module is	l of ass	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	Workload					
240 h						
Teachin	ig cycl	9				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Practica	al cour	se in software			10-l-SWP-152-m01	
Module	e coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e. g. UI ery of the runnable softw	groups, problem ana ML) and milestones, ι are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed leari	ning outcomes				
The stu small te	dents j eams.	possess the practical skil	lls for the design, dev	relopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	er software project in g p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§691N	lr. 1 d)					



Winter Term 2023

(ECTS credits)

Module title					Abbreviation	
Algorit	Algorithmic Graph Theory 10-I-AGT-152-m01					
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
colourin of graph program	ngs, wo h probl ns or h ed learn	ork with planar graphs an lems, we also become far ow we show that they are ning outcomes	d find out how the ra niliar with new conce fixed parameter con	nking algorithm of G epts, for example how nputable.	ioogle works. Using the examples w we model problems as linear	
The stu cipants course,	dents a are ab stude	are able to model typical le to decide which tool fr nts learn in detail how to	problems in compute om the course helps estimate the run time	er science as graph p solve a given graph e of given graph algo	problems. In addition, the parti- problem algorithmically. In this prithms.	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	Ü (2)					
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English craditable for bonus						
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 22	Vr. 3 b)					

Select data series and the secience of the sec	Module	Module title Abbreviation					
Module construction Module offered by Dean of Studies Informatik (Computer Science) Institute of Computer Science ECTS Meture of grading Only after succ. compl. of module(s) 5 numerical grade Duration Module level Other prerequisites Duration undegraduate Contents Selected to jcs: in computer science. Intended to jcs: in computer science. Courses Wethod of assessment (spe, number of weekly contact hours, language – if other than German, examination of or ec and jot transfer them to related to jos. Written examination of one candidate each (approx. 60 to 120 minutes). Written examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).	Selected Basics of Computer Science 10-I-GI-152-mo1					10-l-Gl-152-m01	
Dean First State Institute of Computer Science Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) Solution 5 numerical grade Duration Module level Other prerequisites 1 semesting undergraduate Contents Selected topics in computer science. Intended tearning outcomes The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses	Module	e coord	inator		Module offered by		
ECTS Metio of grading Only after succ. compl. of module(s) 5 numerical grade Duration Module level Other prerequisites 1 sem ster undergraduate Contents Selected topics in computer science. Intended learning outcomes Intended learning outcomes The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses (type, number of weekly contact hours, language – if other than German) V (4) + Û (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Alditional information Teaching cycle Teaching cycle	Dean o	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
5 numerical grade Duration Module level Other prerequisites 1 sem ster undergraduate Contents Selected topics in computer science. Intended learning outcomes The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses (type, number of weekly contact hours, language – if other than German) V (4) + Ú (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) Aldicational information Mokload 150 h 150 h Teaching cycle </td <td>ECTS</td> <td>Metho</td> <td>od of grading</td> <td>Only after succ. com</td> <td>pl. of module(s)</td> <td></td>	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Selected topics in computer science. Intended learning outcomes Intended learning outcomes Intended learning outcomes Intended learning outcomes Courses (type, number of weekly contact hours, language – if other than German) V V V (a) + ① (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) Aldication of Jace Estimation Image of assessment: German and/or English creditable for bonus ** Morkload Image of assessment: German and/or English creditable for bonus ** Image of assessment: German and/or English creditable for	5	nume	rical grade				
n semester undergraduate	Duratio	n	Module level	Other prerequisites			
Contents Selected topics in computer science. Intended learning outcomes The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses (type, number of weekly contact hours, language – if other than German) V (4) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO1 (examination regulations for teaching-degree programmes)	1 seme	ster	undergraduate				
Selected topics in computer science. Intended learning outcomes The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses (type, number of weekly contact hours, language – if other than German) V (4) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Morkload 150 h Teaching cycle Referred to in LPO 1 (examination regulations for teaching-degree programmes)	Conten	ts					
Intended learning outcomes The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses (type, number of weekly contact hours, language – if other than German) V (4) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination for groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 20 minutes) or an oral examination for assessment: German and/or English creditable for bonus Allocation of places	Selecte	d topic	s in computer science.				
The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics. Courses (type, number of weekly contact hours, language – if other than German) V (4) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Morkload 150 h Teaching cycle Referred to in LPO1 (examination regulations for teaching-degree programmes)	Intende	ed leari	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) V (4) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
V (4) + Ü (2) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Yorkload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	V (4) +	Ü (2)					
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) 	Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	written If anno examin prox. 19 Langua credita	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English					
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Allocat	ion of p	olaces				
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)							
 Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) 	Additio	nal inf	ormation				
Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)							
150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	150 h						
Referred to in LPO I (examination regulations for teaching-degree programmes)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Advanc	Advanced Programming 10-I-APR-172-m01					
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Its					
grams. and co de a se cussed	lf more de dup ensible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	mal results like long e is to be conveyed oftware security and	, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	its learr ipleme ocessir	n advanced programming nted in multiple languag ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space a y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	U (2)					
Metho module is	d of ass s creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus						
Allocat	ion of p	olaces				
Additional information						
Workload						
150 h						
Teachi	Teaching cycle					
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Practi course in hardware 10-I-HWP-152-m01 Module correction Module offered by Dean of Studies Informatik (Computer Science) Institute of Computer Science ECTS Met+ of grading Only after succ. com- I. of module(s) 10 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Practical superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete Practical superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete Interde tearset Soft example in communication technoly, robots or the structure of a complete The stude superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete The stude superiments on hardware aspects, for example in communication technoly, robots or the structure of a complete The stude superiment sup	Module	Module title Abbreviation					
Module correction Module offered by Dean → Function Institute of Computer Science ECTS Method f grading Only after succ. complete(s) 10 (not) → cossfully completed Duration Module level Other prerequisites 1 sem → r Module level Other prerequisites 1 sem → r undergraduate Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended by Intended by Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended by Fresultents are able to independently search for example in complete microprocessor. The sture structure of a complete microprocessor. The sture structure structure of a complete microprocessor. The sture structure	Practical course in hardware 10-I-HWP-152-m01						
Dean of Studies Informatik (Computer Science) Institute of Computer Science ECTS Met→ of grading Only after succ. compl. of module(s) 10 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes Intendent learning outcomes The students are able to independently search for additional information as well as to document and evaluate experiment are suble to independently search for additional information as well as to document and evaluate experiment	Module	coord	inator		Module offered by		
ECTS Met→ of grading Only after succ. compl. of module(s) 10 (not) Juccessfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Fractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learting outcomes Fractical experiments on independently search for additional information as well as to document and evaluate experiment descriptions, to independently search for additional information as well as to document and evaluate experiment evaluate experiment evaluate evaluate experiment evaluate ev	Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
10 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment recently	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
DurationModule levelOther prerequisites1 semesterundergraduateContentsPractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor.Intended learning outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment	10	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment receiver.	Duratio	n	Module level	Other prerequisites			
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Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.	Conten	ts					
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment	Intende	ed learr	ning outcomes				
	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	<i>r</i> eview, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
Courses (type, number of weekly contact hours, language — if other than German)	Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)	P (6)						
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)	Method module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)	portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Allocation of places	Allocat	ion of p	olaces				
Additional information							
Workload							
300 h							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)	Referre						
§ 22 II Nr. 3 b)	§ 22 N	vr. 3 b)					

Module title					Abbreviation	
IT Secu	rity				10-I-SEC-191-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e II	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 The course provides a broad sweep through concepts and technologies related to IT security: Theoretical aspects: information-theoretic security, computational security, introduction to cryptography (historical and modern ciphers, hash functions, pseudo-random generators, message authentication co-des, public key cryptography) Network security: protocol security, security of TCP/IP, public key infrastructure, user authentication Software security: Software vulnerabilities, common programming errors and exploitation techniques, reverse engineering and obfuscation, malware and anti-malware Platform security: access control models, security policies, operating system security, virtualization, security mechanisms with support in hardware Intended learning outcomes 						
going to exercise	o unde es prov	rstand the purpose and f ride some hands-on expe	unction of several sec rience of security flow	curity technologies, ws in software.	as well as their limitations. The	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + Module	U (2) e taugh	t in: German and/or Engl	ish			
Method module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus						
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Aerosp	ace Lat	ooratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air ai mechai	sensor segme nd spac nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions and systems of air omplex development onents.	on) of a satellite moc ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems ire, hardware, electronics and	
Intende	ed learr	ning outcomes				
electron a devel mentat del.	nics an opmen ion (so	d mechanics by themsel t will be tested: capture ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ice, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exerc	cises (approx. 4 hours	s each)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
180 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module	title			Abbreviation		
Practical Measurement and Control System Engineering 10-I-HMR-152-m01						
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in ology.	mplementation of linear and non-	
Intende	ed learr	ning outcomes				
Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
project	with p	resentation (approx. 15 m	inutes) and written e	laboration (approx.	12 to 15 pages)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
240 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module	title			Abbreviation		
Practic	al work	Space Technology		10-I-PLR-172-m01		
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
120 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	title				Abbreviation	
Practica	al Cour	se in Programming			10-I-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	nester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow trongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	ing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes If annoi	al exam s) unced	nination (programming ex	vercises, approx. 240	hours) and written e	examination (approx. 60 to 120 tion may be replaced by an oral	
examin prox. 15	ation o ; minut	f one candidate each (ap es per candidate).	prox. 20 minutes) or	an oral examination	in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additional information						
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	lr. 1 c)					
§ 69 Nr. 1 d)						

Project verse	Module	title	Abbreviation				
Module offered byDealInstitute of Computer ScienceECTSMeture of Computer ScienceFParticleSnumerical gradingDurativeModule levelOther prerequisites0undergraduateContensiteundergraduatePresentation of a project developed by the student (e.g. Bachelor's thesis, software project) analogous to a presentation by presented with the help of a poster, a short talk and optionally a live demonstration.Intervention of a project developed by the student (e.g. Bachelor's thesis, software project, which may also be work-in-project, which may also be grouped from the short talk and optionally a live demonstration.Intervention of a project developed by the student from the short talk and optionally a live demonstration.Intervention of a project developed by the candidate analogous to a presentation of a project developed by the candidate analogous to a presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project student deir as well as discussion (a province) to 15 minutes total)Instruct Science at a trade fair a swell as discussion (a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as discussion (a province) to 15 minutes total)Instruct Science at trade fair as well as discussion or EnglishInstruct Science at tarde fair as discussion or EnglishInstruct Science at tarde fair as discussion (I province) total)Instruct Science at tarde fair as discussion (I province) total)Instruct Science At tarde fair as discussion (I province)	Project	Preser	ntation		10-I-PV-152-m01		
Dear Futures Institute of Computer Science ECTS Met→ of grading numerical grade Only after succ. compl. of module(s) 5 numerical grade Duration Module level Other prerequisites 1 semster undergraduate Content Other prerequisites Institute of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intend Earning outcomes Institute of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intend/estation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intend/estation for laypersons with a knowledge of computer science at a trade fair as use also to presentation offered – if not every semester, information on whether module is creditable for bonus) Presentation of a project developed by the candidate analogous to a presentation of r laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. to to 15 minutes total) Language If other than German, examination offered – if not every semester, information on whether module is creditable for bonus)	Module	coord	inator		Module offered by		
ECTSMeter or gradingOnly after succ. compl. of module(s)5numerial gradeDurationModule levelOther prerequisites1 sem sterundergraduateContentsPresentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation or laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intender term sterSoftware of weekly contact hours, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)Software of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of a science at a trade fair as well as discussion (approx. to to 15 minutes total) Language – if so her than German, examination offered – if not every semester, information on whether module is creditable for bonus)Presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of a science at a trade fair as well as discussion (approx. to to 15 minutes total) Language – if so her than German examination offered – if not every semester, information on whether module is creditable for bonus)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)Content set to present a trade fair as well as discussion (approx. to to 15 minutes total) Language – if other than German examination of the set total) 	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
5numerical gradeDurationModule levelOther prerequisites1 sem seriesundergraduateContertCompose of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended territy outcomesThe student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.Intended territy outcomesThe student colspan="2">The student (e.g. Bachelor's thesis, software project) analogous to a presentation of project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.OutcomesMethod territy outcomesIntended territy outcomes <td>ECTS</td> <td>Metho</td> <td>od of grading</td> <td>Only after succ. com</td> <td>pl. of module(s)</td> <td></td>	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate 1 semester undergraduate Contents Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for aypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optically a live demonstration. Intended lear-in-groutcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (s) Method of as-essment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) anguage of as-essment: German et all sciences in a project. Additional information	5	nume	rical grade				
1 semester undergraduate Contents Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intenstudentearming outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (s) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) anguage of assessment: German and/or English Allocation of places	Duratio	n	Module level	Other prerequisites			
Contents Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intended learning outcomes Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowledge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) anguage of assessment: German and/or English Allocation of places Additional information	1 seme	ster	undergraduate				
Presentation of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a pre- sentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration. Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Morkload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts					
Intended learning outcomes The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled-ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Yorkload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. The hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.	
The students are able to present a project they developed and to create the required media. Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Intende	ed learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled-ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.	
S (5) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled-ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	S (5)						
presentation of a project developed by the candidate analogous to a presentation for laypersons with a knowled- ge of computer science at a trade fair as well as discussion (approx. 10 to 15 minutes total) Language of assessment: German and/or English Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	present ge of co Langua	tation o ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)	
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
Additional information Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
 Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additional information						
Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	150 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22 N	vr. 3 b)					
Module	Module title Abbreviation						
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Semina	ır - Sele	ected Topics in Computer	Science 1		10-I-SEM1-152-m01		
Module	coord	inator		Module offered by			
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 Ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-		
Intende	ed learr	ning outcomes					
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S (2)							
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	on (approx. 30 to 45	minutes) with subsequent dis-		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
150 h							
Teaching cycle							
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
§ 22 II Nr. 3 b)							

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Wrap-u Langua	p repoi ge of a	rt on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation				
Practical course in software					10-l-SWP-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	(not) s	successfully completed	10-I-PP, 10-I-ST		
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-
Conten	ts				
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-
Intende	ed learr	ning outcomes			
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	elopment and execu	ution of a software project in
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (6)					
Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in p)	groups (approx. 300	hours per person) and final pre-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
300 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
§691N	lr. 1 d)				

Module title					Abbreviation
Control	Princi	ples of Modern Communi	cation Systems		10-l-SKS-191-m01
Module	coord	inator		Module offered by	
holder	of the C	Chair of Computer Science	e III	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
8	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Content	ts				
• X • B • H • C • S • C	ontrol lultime roadba lobile (ome A urrent oftware oftware ontrol	Mechanisms of Modern C dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SD mechanisms implemente tion of analytical perform	f Things (IoT) N) and deployed on the state of the second	ne Internet	
Intende	d learn	ning outcomes			
The stur dern co measur analytic Courses	dents p mmuni ement cal perf 6 (type, n	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered in anguage — if other than Ger	ructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- rotocols within simulations and methodologies in the field of
V (4) + Ü	Ü(2)	,			
Method module is	l of ass	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	Workload				
240 h					
Teachin	ig cycl	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	



Summer Term 2024

(ECTS credits)

Module title					Abbreviation
Algorithmic Graph Theory					10-I-AGT-152-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
colourin of grap prograr Intende The stu cipants	ngs, wo h probl ns or h ed learn dents a are ab	ork with planar graphs an ems, we also become far ow we show that they are ning outcomes are able to model typical le to decide which tool fr	d find out how the ra niliar with new conce e fixed parameter con problems in compute om the course helps	nking algorithm of G epts, for example how nputable. er science as graph p solve a given graph	oogle works. Using the examples w we model problems as linear problems. In addition, the parti- problem algorithmically. In this
course,	stude	nts learn in detail how to	estimate the run time	e of given graph algo	prithms.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +					
module is	creditab	le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap res per candidate). ssessment: German and, bonus	minutes). inning of the course, prox. 20 minutes) or ′or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	Vr. 3 b)				

Module	Module title Abbreviation					
Selecte	d Basi	cs of Computer Science			10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	ıg cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module title				Abbreviation	
Advanced Programming					10-I-APR-172-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
grams. and coo de a se cussed	lf more de dup nsible	complex problems are to licates occur. In this lectu structure. Also, further to	b be tackled, subopti re, further knowledg pics in the areas of s	mal results like long e is to be conveyed o oftware security and	incomprehensible functions on how to give programs and co- parallel programming are dis-
Intende	ed leari	ning outcomes			
Studen then im allel pro sing.	ts learr pleme ocessir	a advanced programming nted in multiple language og concepts are introduce	paradigms especiall es and their efficiency ed culminating in the	y suited for space ap y measured using sta use of GPU architect	oplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-
V(2) +	ü (2)			inany	
Methoo module is	of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examinunced ation o minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, prox. 20 minutes) or ′or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22	§ 22 II Nr. 3 b)				

Practication of mathematication of the structure of the struct	Module	Module title Abbreviation					
Module offered byDealInstitute of Computer ScienceECTSM=ture StratementInstitute of Computer ScienceInstitute of Computer ScienceECTSM=due IeelOnly after succ. completionDurativeModule IeelOnly after succ. completionDurativeModule IeelOnly after succ. completion1 semestriModule IeelOnly after succ. completionPractical regionModule IeelOnly after succ. completionContestricIndegraduate	Practical course in hardware					10-l-HWP-152-m01	
Dear Studies Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) in (not) successfully completed	Module	coord	inator		Module offered by		
ECTSMete or gradingOnly after succ. compl. of module(s)10(not) successfully completedDurationModule levelOther prerequisites1 sem sterundergraduateContentsTractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complet microprocessor.Intended terming outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Courses (type, number of weekly contact hours, language – if other than German)P (6)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)Additional informationCourses to induce is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 20 hours total)<	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
10 (not) successfully completed Duration Module level Other prerequisites 1 sem ster undergraduate Contents Fractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Module is creditable for bonus) Information of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Yorkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) S 22 II Nr. 3 b)	10	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places	Duratio	n	Module level	Other prerequisites			
Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO 1 (examination for teaching-degree programmes) § 22 Il Nr. 3 b)	1 seme	ster	undergraduate				
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts					
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Intende	ed learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	/ review, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	P (6)						
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	portfoli (approx	o: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
 Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additio	nal info	ormation				
Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Worklo	Workload					
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 Nr. 3 b)	Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
	§ 22	Vr. 3 b)					

Module title					Abbreviation	
IT Secu	rity				10-l-SEC-191-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e II	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
The could be a could be could be could be a could be a could be a could be a could	heoreti historic es, pul etwork oftwar everse latform urity m	ical aspects: information- cal and modern ciphers, h blic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co ash functions, pseud ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors iti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed lear					
and ana going to exercise	ts will l alyze s o unde es prov	be introduced to the main ecurity of a system critica rstand the purpose and fi vide some hands-on expe	n concepts and abstra Illy from the attacker unction of several sec rience of security flov	actions of II security view point. After visi curity technologies, ws in software.	iting the lecture students are as well as their limitations. The	
Courses	5 (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + l Module	Ü (2) taugh	t in: German and/or Engl	ish			
Method module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	examinunced ation c minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additional information						
Worklo	Workload					
150 h	150 h					
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Aerosp	ace Lat	poratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by	· · · · · · · · · · · · · · · · · · ·	
holder	of the C	Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air a mechai	sensor segme nd spac	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (construction nts and systems of ai pomplex development onents.	on) of a satellite moo ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems re, hardware, electronics and	
Intende	ed learr	ning outcomes				
electron a devel mentat del.	nics an opmen ion (so	d mechanics by themsel t will be tested: capture ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ce, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hour	s each)		
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
180 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module title Abbreviation					Abbreviation	
Practica	al Mea	surement and Control Sy	stem Engineering		10-I-HMR-152-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in ology.	nplementation of linear and non-	
Intende	ed learr	ning outcomes				
Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
project	with p	resentation (approx. 15 m	inutes) and written e	laboration (approx.	12 to 15 pages)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
240 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module title					Abbreviation	
Practical work Space Technology					10-I-PLR-172-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed lear	ning outcomes				
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (2)						
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
120 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Practica	al Cour	se in Programming			10-I-PP-191-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	nester	undergraduate	Intended learning of GdP. It is therefore s	utcomes of the follow trongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of si	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes If annoi	al exam s) unced	nination (programming e	vercises, approx. 240	hours) and written e	examination (approx. 60 to 120 tion may be replaced by an oral	
examin prox. 15	ation o ; minut	of one candidate each (ap es per candidate).	prox. 20 minutes) or	an oral examination	in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	lr. 1 c)					
§ 69 l Nr. 1 d)						

Module title					Abbreviation
Project	Preser	itation			10-I-PV-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, softw nce at a trade fair. Th hort talk and optiona	ware project) analogous to a pre- he project, which may also be ally a live demonstration.
Intende	ed learn	ning outcomes			
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (5)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Workload					
150 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	Vr. 3 b)				

Module	Module title Abbreviation					
Seminar - Selected Topics in Computer Science 1 10-I-SEM1-152-m01						
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 Ferent lecturers).	ure and, where applicable, soft- -I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	n (approx. 30 to 45 i	ninutes) with subsequent dis-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h	150 h					
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 Nr. 3 b)						

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Wrap-u Langua	p repoi ge of a	rt on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module title Abbreviation					Abbreviation
Practical course in software					10-l-SWP-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	(not) s	successfully completed	10-I-PP, 10-I-ST		
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-
Conten	ts				
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-
Intende	ed learr	ning outcomes			
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	velopment and execu	ution of a software project in
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (6)					
Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in p)	groups (approx. 300	hours per person) and final pre-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
300 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
§691N	lr. 1 d)				

Module title					Abbreviation	
Control	Princi	ples of Modern Communi	cation Systems		10-l-SKS-191-m01	
Module	coord	inator		Module offered by		
holder	of the O	Chair of Computer Scienc	e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
• C • M • H • C • S • C	 Control Mechanisms of Modern Communication Systems Multimedia Networking Broadband Access Networks Mobile Communication Systems Home Access Networks Current trends such as Internet of Things (IoT) Software Defined Networking (SDN) Control mechanisms implemented and deployed on the Internet 					
Intende	d learr	ning outcomes				
The stur dern co measur analytic Courses	dents p mmuni ement cal perf s (type, n	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation. umber of weekly contact hours, l	edge regarding the st able to apply it to eva ents have gathered i 	ructure, architecture luate systems and p nsights of the basic 	e and control mechanisms of mo- protocols within simulations and methodologies in the field of	
V (4) + ĺ	Ü (2)					
Method module is	l of ass	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	examir unced l ation o minut ge of a ole for	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	Workload					
240 h	240 h					
Teachin	ig cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		



Winter Term 2024

(ECTS credits)

Module title					Abbreviation
Algorithmic Graph Theory					10-I-AGT-152-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
colourin of graph program	ngs, wo h probl ns or h ed learn	ork with planar graphs an lems, we also become far ow we show that they are ning outcomes	d find out how the ra niliar with new conce fixed parameter con	nking algorithm of G epts, for example how nputable.	ioogle works. Using the examples w we model problems as linear
The stu cipants course,	dents a are ab stude	are able to model typical le to decide which tool fr nts learn in detail how to	problems in compute om the course helps estimate the run time	er science as graph p solve a given graph e of given graph algo	problems. In addition, the parti- problem algorithmically. In this prithms.
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	Ü (2)				
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written If annou examin prox. 15 Langua credital	examin unced l ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
§ 22	§ 22 II Nr. 3 b)				

Module	Module title Abbreviation					
Selecte	d Basi	cs of Computer Science			10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Advanc	ed Pro	gramming			10-I-APR-172-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
grams. and coo de a se cussed	If more de dup nsible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	e is to be conveyed offware security and	r, incomprehensible functions on how to give programs and co- I parallel programming are dis-	
Intende	ed learı	ning outcomes				
Studen then im allel pr sing.	ts learr pleme ocessir	n advanced programming nted in multiple languag ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space ap y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +						
module is	s creditab	le for bonus)	ge — If other than German, (examination offered — if no	ot every semester, information on whether	
written If anno examin prox. 19 Langua credita	examin unced nation o 5 minut uge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg If one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	Additional information					
Workload						
150 h						
Teachi	Teaching cycle					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22	§ 22 Nr. 3 b)					

Practication of mathematication of the structure of the struct	Module title Abbreviation					Abbreviation	
Module offered byDealInstitute of Computer ScienceECTSM=ture StratementInstitute of Computer ScienceInstitute of Computer ScienceECTSM=due IeelOnly after succ. completionDurativeModule IeelOnly after succ. completionDurativeModule IeelOnly after succ. completion1 semestriModule IeelOnly after succ. completionPractical regionModule IeelOnly after succ. completionContestricIndegraduate	Practical course in hardware					10-l-HWP-152-m01	
Dear Studies Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) in (not) successfully completed	Module	coord	inator		Module offered by		
ECTSMete or gradingOnly after succ. compl. of module(s)10(not) successfully completedDurationModule levelOther prerequisites1 sem sterundergraduateContentsTractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complet microprocessor.Intended terming outcomesThe students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.Courses (type, number of weekly contact hours, language – if other than German)P (6)Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)Additional informationCourses to induce is creditable for bonus)portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 20 hours total)<	Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
10 (not) successfully completed Duration Module level Other prerequisites 1 sem ster undergraduate Contents Fractical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Module is creditable for bonus) Information of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 3 to 10 project assignments (approx	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Yorkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) S 22 II Nr. 3 b)	10	(not) s	successfully completed				
1 semester undergraduate Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of aspectsment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places	Duratio	n	Module level	Other prerequisites			
Contents Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO 1 (examination for teaching-degree programmes) § 22 Il Nr. 3 b)	1 seme	ster	undergraduate				
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor. Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment de- scriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Morkload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Conten	ts					
Intended learning outcomes The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Practica a comp	al expe lete mi	riments on hardware asp croprocessor.	ects, for example in o	communication tech	nology, robots or the structure of	
The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 Il Nr. 3 b)	Intende	ed learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	The stu scriptio results.	dents a ons, to i	are able to independently ndependently search for	/ review, prepare and additional information	perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment	
P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	P (6)						
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project) Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	portfoli (approx	0: com (. 10 mi	pletion of approx. 3 to 10 nutes per project)	project assignments	approx. 250 hours	total) and presentation of results	
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Allocat	ion of p	olaces				
Additional information Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
 Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Additio	nal info	ormation				
Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Workload						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	300 h						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b)							
§ 22 Nr. 3 b)	Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	§ 22	Vr. 3 b)					

Module title					Abbreviation	
IT Secu	rity				10-l-SEC-191-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
 Till (ł N S re P ci 	heoreti nistoric es, pul etwork oftwar everse latform urity m	ical aspects: information- cal and modern ciphers, h blic key cryptography) c security: protocol securi e security: Software vuln engineering and obfusca n security: access control echanisms with support	theoretic security, co ash functions, pseuc ty, security of TCP/IP erabilities, common tion, malware and an models, security pol in hardware	mputational security lo-random generator , public key infrastru programming errors iti-malware icies, operating syst	y, introduction to cryptography rs, message authentication co- acture, user authentication and exploitation techniques, em security, virtualization, se-	
Intende	ed lear	ning outcomes				
Studen and and going to exercise	ts will l alyze s o unde es prov S (type r	be introduced to the main ecurity of a system critica rstand the purpose and fiv ride some hands-on expenses	n concepts and abstra Illy from the attacker unction of several sec rience of security flow anguage — if other than Ger	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
V (2) +	Ü (2)					
Module	taugh	t in: German and/or Engl	ish			
Methoo module is	l of ass creditab	Sessment (type, scope, langua Ile for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	examin unced ation c minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap tes per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additional information						
Worklo	Workload					
150 h	150 h					
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Aerosp	ace Lal	ooratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by	· · · · · · · · · · · · · · · · · · ·	
holder	of the (Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air ai mechai	sensor segme nd spae nics. Se	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (constructions of a construction of a	on) of a satellite moo ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems re, hardware, electronics and	
Intende	ed learı	ning outcomes				
electron a devel mentat del.	nics an Iopmen ion (so	d mechanics by themselv t will be tested: capture o ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ce, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hours	s each)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
180 h						
Teaching cycle						
Referre	a to in	LPU I (examination regulation:	s for teaching-degree progra	mmes)		

Module title Abbreviation							
Practic	Practical Measurement and Control System Engineering 10-I-HMR-152-mo1						
Module	coord	inator		Module offered by			
holder	of the C	Chair of Computer Scienc	e VI	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
8	(not) s	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Practica linear c	al expe ontroll	riments of control aspect ers in robotics or aerospa	s (hardware and soft ace information techr	ware), for example in ology.	mplementation of linear and non-		
Intende	ed learr	ning outcomes					
Studen	ts unde	erstand closed loop syste	ems and are able to ir	nplement and set co	ontrollers.		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
P (6)							
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
project	with p	resentation (approx. 15 m	inutes) and written e	laboration (approx.	12 to 15 pages)		
Allocat	ion of p	olaces					
Additio	nal info	ormation					
Workload							
240 h							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							

Module title					Abbreviation
Practical work Space Technology					10-I-PLR-172-m01
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)	
4	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Comple	etion of	a practical task.			
Intende	ed lear	ning outcomes			
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
P (2)					
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
120 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation					
Practical Course in Programming				10-I-PP-191-m01		
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1-2 sem	lester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.	
Conten	ts					
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120	
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§491N	r. 1 c)					
§ 69 Nr. 1 d)						

Module	e title		Abbreviation			
Project Presentation					10-I-PV-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Present sentatio work-in	tation of on for l -progre	of a project developed by aypersons with a knowle ess, is presented with the	the student (e.g. Ba dge of computer scie help of a poster, a s	chelor's thesis, soft nce at a trade fair. T hort talk and option	ware project) analogous to a pre- he project, which may also be ally a live demonstration.	
Intende	ed learn	ning outcomes				
The stu	dents a	are able to present a proj	ect they developed a	nd to create the requ	uired media.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (5)						
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
present ge of co Langua	tation c ompute ge of a	of a project developed by r science at a trade fair a ssessment: German and,	the candidate analog s well as discussion /or English	gous to a presentatio (approx. 10 to 15 mir	on for laypersons with a knowled- nutes total)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	Vr. 3 b)					

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 1 10-I-SEM1-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science c n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 Ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed learr	ning outcomes				
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatic nputer science /or English	on (approx. 30 to 45 i	minutes) with subsequent dis-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 22 Nr. 3 b)						

Module	Module title Abbreviation						
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-mo1						
Module	coord	inator		Module offered by			
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-		
Intende	ed learn	ning outcomes					
The stu aspects	dents a s in writ	are able to independently tten form and to orally pr	review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S (2)							
Methoo module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Wrap-u Langua	p repoi ge of a	t on tutoring activities (5 ssessment: German and,	to 10 pages) /or English				
Allocat	ion of p	olaces					
Additio	nal infe	ormation					
Workload							
150 h							
Teaching cycle							
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			

Module	Module title Abbreviation					
Practical course in software					10-l-SWP-152-m01	
Module coordinator				Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	(not) s	successfully completed	10-I-PP, 10-I-ST			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	In addition, the know required. Prior atten ded.	wledge and skills ac dance of this modul	quired in module 10-I-ADS are e is therefore highly recommen-	
Conten	ts					
Comple cation o tion and	etion of of solut d delive	a project assignment in ion components (e.g.U/ ery of the runnable softw	groups, problem ana ML) and milestones, ı are product in a collo	lysis, creation of req user manual, program quium.	uirements specifications, specifi- mming documentation, presenta-	
Intende	ed learr	ning outcomes				
The stu small te	dents p eams.	possess the practical skil	lls for the design, dev	elopment and execu	ution of a software project in	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
P (6)						
Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
practica sentatio	al proje on (app	ect (Completion of a large prox. 10 minutes per grou	r software project in g p)	groups (approx. 300	hours per person) and final pre-	
Allocat	ion of p	olaces				
Additio	Additional information					
Workload						
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§691N	§ 69 Nr. 1 d)					

Module title					Abbreviation	
Control	Princi	ples of Modern Communi	cation Systems		10-I-SKS-242-m01	
Module coordinator				Module offered by		
holder of the Chair of Computer Science III			e III	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Content	ts					
• M • B • M • H • C • S • C	ontrol lultime roadba lobile (ome A urrent oftware ontrol ntroduc	Mechanisms of Modern C dia Networking and Access Networks Communication Systems ccess Networks trends such as Internet o e Defined Networking (SE mechanisms implemente tion of analytical perform	f Things (IoT) N) and deployed on the state of the second s	ne Internet		
Intende	d learn	ning outcomes				
The stu- dern co measur analytic	dents p mmuni ement cal perf	oossess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered i	tructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- protocols within simulations and methodologies in the field of	
V (2) + İ	Ü (2)	,,,,,,,,,				
Method module is	l of ass	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written If annou examin prox. 15 Langua credital	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus					
Allocati	ion of p	olaces				
Additional information						
Workloa	Workload					
150 h						
Teachin	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		



Summer Term 2025

(ECTS credits)

Module title Abbreviation					Abbreviation	
Algorit	hmic G	raph Theory			10-I-AGT-152-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e l	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
colourin of grap program Intende The stu cipants	ngs, wo h probl ns or h ed learn dents a are ab	ork with planar graphs an ems, we also become far ow we show that they are ning outcomes are able to model typical le to decide which tool fr	d find out how the ra niliar with new conce e fixed parameter con problems in compute om the course helps	nking algorithm of G epts, for example how nputable. er science as graph p solve a given graph	we model problems as linear problems. In addition, the parti- problem algorithmically. In this	
course,	stude	nts learn in detail how to	estimate the run time	e of given graph algo	prithms.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	U (2)	•				
module is	creditab	;essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
written If annou examin prox. 15 Langua credital	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus					
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22	Vr. 3 b)					
Module	Module title Abbreviation					
-----------------------------------------------------------------	-------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------	--------------------------------------------	-------------------------------------------------------------------	--
Selecte	d Basi	cs of Computer Science			10-l-Gl-152-m01	
Module	e coord	inator		Module offered by		
Dean of	f Studie	es Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Selecte	d topic	s in computer science.				
Intende	ed leari	ning outcomes				
The stu them to	dents a relate	are able to understand so d topics.	olutions to fundamen	tal problems in com	puter science and to transfer	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written If annot examin prox. 15 Langua credital	examin unced ation o 5 minut ge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg of one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, pprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation				
Advanc	ed Pro	gramming			10-I-APR-172-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e ll	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
grams. and coo de a se cussed	If more de dup nsible	e complex problems are to licates occur. In this lectu structure. Also, further to	o be tackled, subopti ure, further knowledg pics in the areas of s	e is to be conveyed offware security and	r, incomprehensible functions on how to give programs and co- I parallel programming are dis-
Intende	ed learı	ning outcomes			
Studen then im allel pr sing.	ts learr pleme ocessir	n advanced programming nted in multiple languag ng concepts are introduce	paradigms especial es and their efficienc ed culminating in the	ly suited for space ap y measured using sta use of GPU architect	pplications. Different patterns are andard metrics. In addition, par- tures for extremely quick proces-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +					
module is	s creditab	le for bonus)	ge — If other than German, (examination offered — if no	ot every semester, information on whether
written If anno examin prox. 19 Langua credita	examin unced nation o 5 minut uge of a ble for	nation (approx. 60 to 120 by the lecturer at the beg If one candidate each (ap es per candidate). ssessment: German and, bonus	minutes). inning of the course, oprox. 20 minutes) or /or English	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocat	ion of p	olaces			
Additional information					
Workload					
150 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
§ 22 II Nr. 3 b)					

Module lille		Module title Abbreviation				
Practical course in hardware			10-l-HWP-152-m01			
Module coordinator		Module offered by				
Dean of Studies Informatik (Compu	ter Science)	Institute of Comput	er Science			
ECTS Method of grading	Only after succ. con	npl. of module(s)				
10 (not) successfully complete	ed					
Duration Module level	Other prerequisites					
1 semester undergraduate						
Contents						
Practical experiments on hardware a complete microprocessor.	aspects, for example in	communication tech	nology, robots or the structure of			
Intended learning outcomes						
The students are able to independe scriptions, to independently search results.	ently review, prepare and n for additional informati	l perform experiment on as well as to docu	ts with the help of experiment de- ument and evaluate experiment			
Courses (type, number of weekly contact ho	urs, language — if other than Gei	rman)				
P (6)						
Method of assessment (type, scope, la module is creditable for bonus)	nguage — if other than German,	examination offered — if no	ot every semester, information on whether			
portfolio: completion of approx. 3 t (approx. 10 minutes per project)	o 10 project assignments	s (approx. 250 hours	total) and presentation of results			
Allocation of places						
Additional information						
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 22 II Nr. 3 b)						

Module title				Abbreviation		
IT Secu	rity				10-l-SEC-191-m01	
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e II	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Contents					
 Till (ł N S re P ci 	 The course provides a broad sweep through concepts and technologies related to IT security: Theoretical aspects: information-theoretic security, computational security, introduction to cryptography (historical and modern ciphers, hash functions, pseudo-random generators, message authentication co-des, public key cryptography) Network security: protocol security, security of TCP/IP, public key infrastructure, user authentication Software security: Software vulnerabilities, common programming errors and exploitation techniques, reverse engineering and obfuscation, malware and anti-malware Platform security: access control models, security policies, operating system security, virtualization, se- 					
Intende	ed lear	ning outcomes				
Studen and and going to exercise	ts will l alyze s o unde es prov	be introduced to the main ecurity of a system critica rstand the purpose and fi vide some hands-on expe	n concepts and abstra Illy from the attacker unction of several sec rience of security flow	actions of IT security view point. After visi curity technologies, ws in software.	r. They learn how to model threats iting the lecture students are as well as their limitations. The	
V(2) +	з (туре, т					
Module	e taugh	t in: German and/or Engl	ish			
Methoo module is	l of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus						
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		

Module	Module title Abbreviation					
Aerosp	ace Lat	poratory			10-I-LRLA-172-m01	
Module	e coord	inator		Module offered by		
holder	of the C	Chair of Computer Scienc	e VIII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
stems, ground of air a mechai	sensor segme nd spac	s and actuators, energy, ent for different compone ce flight. Life cycle of a co election of suitable comp	structure (construction nts and systems of ai pomplex development onents.	on) of a satellite moo ir and space flight, s consisting of softwa	del/simulator, construction of a tructure of simplified subsystems re, hardware, electronics and	
Intende	ed learr	ning outcomes				
electron a devel mentat del.	nics an opmen ion (so	d mechanics by themsel t will be tested: capture ftware, hardware, mecha	ves as well as to oper of requirements, rudi nics), test design, ins	rate, test and docum mentary design, det spection, maintenan	ent these. The whole life cycle of ailed design, modelling, imple- ce, transfer to the successor mo-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	P (2)					
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
Comple	etion of	approx. 6 practical exer	cises (approx. 4 hour	s each)		
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
180 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Practic L we surface and Control System Engineering 10-1-HMR-152-m01 Module of fered by Institute of Computer Science Institute of Computer Science Reffered by Grading Only after succ. or module(s) 8 (not) successfully completed Duration Module level Other prerequisites Contents undergraduate Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controlies or aerospace information technology. Intervention of the set of t	Module title Abbreviation				Abbreviation	
Module coordinator Module offered by holder of the Chair of Computer Science VI Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 8 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Contents Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Addictional information 240 h	Practical Measurement and Control System Engineering 10-I-HMR-152-m01					10-I-HMR-152-m01
hole Far of yarding Only after succ. compl. of module(s) 8 (not) successfully completed	Module	coord	inator		Module offered by	
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Duration Module level Other prerequisites 1 semester undergraduate Contents Practical expriments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology. Intended learning outcomes Students understand closed loop systems and are able to implement and set controllers. Courses (type, number of weekly contact hours, language – if other than German) P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places 4dditional information 240 h Referred to in LPO I (examination regulations for teaching-degree programmes) <t< td=""><td>8</td><td>(not) s</td><td>successfully completed</td><td></td><td></td><td></td></t<>	8	(not) s	successfully completed			
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P (6) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages) Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	P (6)					
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Allocation of places Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	project	with p	resentation (approx. 15 m	ninutes) and written e	laboration (approx.	12 to 15 pages)
Additional information Additional information Vorkload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Allocat	ion of p	olaces			
Additional information Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)						
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Additio	nal info	ormation			
Workload 240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)						
240 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	Workload					
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes)	240 h					
Referred to in LPO I (examination regulations for teaching-degree programmes)	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module title				Abbreviation	
Practical work Space Technology					10-I-PLR-172-m01
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)	
4	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Comple	etion of	a practical task.			
Intende	ed lear	ning outcomes			
The pra	ctical a	allows participants to wo	rk on a problem in sp	ace information tech	nnology in teams.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
P (2)					
Methoo module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
report (5 to 10	pages) and presentatior	(approx. 15 minutes)) on practical work	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
120 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module	Module title Abbreviation				
Practical Course in Programming					10-I-PP-191-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
10	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1-2 sem	lester	undergraduate	Intended learning ou GdP. It is therefore s	utcomes of the follow strongly recommende	ving module are required: 10-l- ed to complete this before.
Conten	ts				
The pro	gramm	iing language Java. Indep	endent creation of sr	nall to middle-sized	, high-quality Java programs.
Intende	ed learı	ning outcomes			
The stu	dents a	are able to independently	/ develop small to mi	ddle-sized, high-qua	ality Java programs.
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (6)					
Method module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
practica minutes	al exan s)	nination (programming ex	kercises, approx. 240	hours) and written e	examination (approx. 60 to 120
lf annou examin prox. 15	unced ation o ; minut	by the lecturer at the beg of one candidate each (ap res per candidate).	inning of the course, pprox. 20 minutes) or	the written examina an oral examination	tion may be replaced by an oral in groups of 2 candidates (ap-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§491N	r. 1 c)				
§ 69 Nr. 1 d)					

Module	Module title Abbreviation				
Seminar - Selected Topics in Computer Science 1 10-I-SEM1-152-m01					10-I-SEM1-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Informatik (Computer S	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	on the basis of literat les 10-I-SEM1 and 10 ferent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-
Intende	ed leari	ning outcomes			
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (2)					
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written cussior Langua	elabor 1 on a t ge of a	ation (approx. 10 to 15 pa opic from the field of con ssessment: German and,	ages) and presentatio nputer science /or English	on (approx. 30 to 45 i	minutes) with subsequent dis-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22 Nr. 3 b)					

Module	Module title Abbreviation					
Semina	Seminar - Selected Topics in Computer Science 2 10-I-SEM2-152-m01					
Module	coord	inator		Module offered by		
Dean of	fStudie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Indeper ware wi rent are	ndent r ith writ eas (thi	eview of a current topic i ten and oral presentatior s usually means that the	n computer science o n. The topics in modu y are assigned by diff	n the basis of literat les 10-I-SEM1 and 10 erent lecturers).	ture and, where applicable, soft- o-I-SEM2 must come from diffe-	
Intende	ed leari	ning outcomes				
The stu aspects	dents a s in wri	are able to independently tten form and to orally pr	/ review a current top esent these in an app	ic in computer scien propriate way.	ce, to summarise the main	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2)						
Methoo module is	l of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Wrap-u Langua	p repoi ge of a	rt on tutoring activities (5 ssessment: German and,	to 10 pages) /or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
150 h						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		

Module title				Abbreviation	
Control Principles of Modern Communication Systems				10-I-SKS-242-m01	
Module coord	inator		Module offered by		
holder of the (Chair of Computer Scienc	e III	Institute of Comput	er Science	
ECTS Metho	od of grading	Only after succ. com	pl. of module(s)		
5 nume	rical grade				
Duration	Module level	Other prerequisites			
1 semester	undergraduate				
Contents					
 Control Multime Broadba Mobile Home A Current Softwar Control Introduce 	 Control Mechanisms of Modern Communication Systems Multimedia Networking Broadband Access Networks Mobile Communication Systems Home Access Networks Current trends such as Internet of Things (IoT) Software Defined Networking (SDN) Control mechanisms implemented and deployed on the Internet 				
Intended lear	ning outcomes				
The students dern commun measurement analytical per	possess advanced knowl ication systems and are a setups. In addition, stud formance evaluation.	edge regarding the st able to apply it to eva ents have gathered i	tructure, architecture luate systems and p nsights of the basic	e and control mechanisms of mo- protocols within simulations and methodologies in the field of	
$V(2) + \ddot{U}(2)$			inany		
Method of ass module is creditab	sessment (type, scope, langua ile for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English craditable for bonus					
Allocation of	olaces				
Additional information					
Workload					
150 h					
Teaching cycle					
Referred to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		