

Module Catalogue

for the Subject

Aerospace Computer Science

as a Master's with 1 major

with the degree "" (120 ECTS credits)

Examination regulations version: 2025 Responsible: Faculty of Mathematics and Computer Science Responsible: Institute of Computer Science

JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record 88|f25|-|-|H|2025



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The subject is divided into

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Learning Outcomes

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German contents and learning outcome available but not translated yet.

Qualifikationsziele

Nach erfolgreichem Abschluss des Studiums verfügen die Absolventinnen und Absolventen über die folgenden Kompetenzen:

- Die Absolventinnen und Absolventen besitzen hohes Abstraktionsvermögen, die Fähigkeit zu analytischem Denken, hohe Problemlösungskompetenz und die Fähigkeit, komplexe Zusammenhänge zu strukturieren.
- Die Absolventinnen und Absolventen verfügen über einen breiten Überblick über die Teilgebiete der Luft- und Raumfahrtinformatik und interdisziplinäre Zusammenhänge.
- Sie verfügen über vertiefte Kenntnisse der mathematischen, theoretischen und regelungstechnischen Grundlagen der Luft- und Raumfahrtinformatik sowie fundiertes Wissen über die theoretischen und praktischen Methoden zur Erlangung neuer Erkenntnisse.
- Sie sind in der Lage, ihre Fähigkeiten und Kenntnisse in Projekten umzusetzen und verfügen über Kenntnisse des aktuellen Forschungsstandes in mindestens einem Spezialgebiet der Luftund Raumfahrtinformatik.
- Sie sind in der Lage, sich anhand von Primärliteratur, insbesondere in englischer Sprache, in den aktuellen Forschungsstand eines Spezialgebiets einzuarbeiten
- Sie sind in der Lage, mathematische Methoden und Techniken der Luft- und Raumfahrtinformatik selbstständig auf konkrete praktische oder theoretische Aufgabenstellungen anzuwenden, Lösungswege zu entwickeln und die Ergebnisse zu interpretieren und zu bewerten.
- Sie sind in der Lage, auch bei unvollständig vorliegenden Informationen Probleme der Luft- und Raumfahrtinformatik unter Anwendung der wissenschaftlichen Arbeitsweise und unter Beachtung der Regeln guter wissenschaftlicher Praxis selbstständig zu bearbeiten und die Ergebnisse und Folgen ihrer Arbeit darzustellen, zu bewerten und zu vertreten.
- Sie sind in der Lage, mit Fachvertreterinnen und Fachvertretern auf dem aktuellen Stand der Forschung Fragestellungen der Luft- und Raumfahrtinformatik zu diskutieren und auch Nichtwissenschaftlerinnen und Nichtwissenschaftlern Zusammenhänge zu erläutern.
- Sie besitzen die Fähigkeit, als Informatikerinnen und Informatiker in interdisziplinär und international zusammengesetzten Teams aus (Natur-) Wissenschaftlerinnen und Wissenschaftlern und/oder Ingenieurinnen und Ingenieuren in Forschung, Industrie und Wirtschaft mitzuwirken oder diese zu leiten.

Wissenschaftliche Befähigung

- Die Absolventinnen und Absolventen können erweiterte mathematische, regelungstechnischen und praktischen Grundlagen der Luft- und Raumfahrtinformatik anwenden.
- Die Absolventinnen und Absolventen können tiefergehende Kenntnisse in mindestens einem Teilgebiet abrufen.
- Die Absolventinnen und Absolventen können fortgeschrittene hard- und/oder softwaregetriebene Experimente durchführen, analysieren, auswerten und die erhaltenen Ergebnisse darstellen.
- Die Absolventinnen und Absolventen sind in der Lage, sich mit Hilfe von Fachliteratur in neue Aufgabengebiete einzuarbeiten und die Ergebnisse zu interpretieren und zu bewerten.
- Die Absolventinnen und Absolventen besitzen Abstraktionsvermögen, analytisches Denken, Problemlösungskompetenz und die Fähigkeit, fortgeschrittene Zusammenhänge zu strukturieren.
- Die Absolventinnen und Absolventen sind in der Lage, fortgeschrittene Methoden der Luft- und Raumfahrtinformatik auf konkrete praktische oder theoretische Aufgabenstellungen anzuwenden, Lösungswege zu entwickeln und die Ergebnisse zu interpretieren und zu bewerten.

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- Die Absolventinnen und Absolventen setzen die erlernten theoretischen und praktischen Methoden in geschlossener Form ein, um zu zeigen, dass sie zur Anwendung der Konzepte wissenschaftlichen Arbeitens befähigt sind.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.
- Die Absolventinnen und Absolventen sind in der Lage, konstruktiv und zielorientiert in einem Team zusammenzuarbeiten und auftretende Konflikte zu lösen (Teamfähigkeit).
- Die Absolventinnen und Absolventen können ihre erworbenen Kompetenzen in unterschiedlichen interkulturellen Kontexten und in international zusammengesetzten Teams anwenden.
- Die Absolventinnen und Absolventen kennen wichtige Anforderungen und Arbeitsweisen im gewerblichen Umfeld sowie in Forschung und Entwicklung.
- Die Absolventinnen und Absolventen sind befähigt, Probleme zu analysieren und zu lösen und sich in weniger vertraute Themenkomplexe einzuarbeiten.

Persönlichkeitsentwicklung

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- Eigenverantwortlichkeit, Selbstständigkeit, Zeitmanagement, Teamfähigkeit.
- Die Absolventinnen und Absolventen kennen die Regeln guter wissenschaftlicher Praxis und beachten sie.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

Befähigung zum gesellschaftlichen Engagement

- Die Absolventinnen und Absolventen können Entwicklungen im Informationssektor kritisch reflektieren und deren Auswirkungen auf die Wirtschaft, Gesellschaft und die Umwelt in Ansätzen erfassen (Technikfolgenabschätzung).
- Die Absolventinnen und Absolventen haben ihr Wissen bezüglich wirtschaftlicher, gesellschaftlicher, kultureller etc. Fragestellungen erweitert und können in Ansätzen begründet Position beziehen.
- Die Absolventinnen und Absolventen entwickeln die Bereitschaft und Fähigkeit, ihre Kompetenzen in partizipative Prozesse einzubringen und aktiv an Entscheidungen mitzuwirken.

Abbreviations used

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:

ASPO2015

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

??-???-2025 (2025-??)

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.





Electives Field (90 ECTS credits)

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Seminars (5 ECTS credits)

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Module title				Abbreviation	
Seminar 1 - Current Topics in Aerospace Computer Science				10-LuRI=SEM1-232-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	graduate			
Conten	ts				
Indeper softwar from di	ndent r e with fferent	eview of a current topic i written and oral presenta areas (this usually mean	n aerospace enginee Ition. The topics in m s that they are assigr	ring on the basis of l odules 10-LURI-SEM ned by different lectu	iterature and, where applicable, 1 and 10-LURI-SEM2 must come Irers).
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 aerospace engi propriate way.	neering, to summarise the main
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (2) Module	taugh	t in: German and/or Engl	ish		
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
term pa semina Langua	iper (10 r ge of a	o to 15 pages) and presen ssessment: German and,	tation (30 to 45 minu /or English	ites) with subsequer	nt discussion on the topic of the
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in			
Master's degree (1 major) Aerospace Computer Science (2023)					

Module title				Abbreviation	
Seminar 2 - Current Topics in Aerospace Computer Science			10-LuRI=SEM2-232-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)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
Indeper softwar from dif	ndent r e with fferent	eview of a current topic i written and oral presenta areas (this usually mean	n aerospace enginee Ition. The topics in m s that they are assigr	ring on the basis of l odules 10-LURI-SEM ned by different lectu	iterature and, where applicable, 1 and 10-LURI-SEM2 must come Irers).
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 aerospace engi propriate way.	neering, to summarise the main
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (2) Module	taugh	t in: German and/or Engl	ish		
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
term pa semina Langua	iper (10 r ge of a	o to 15 pages) and presen	tation (30 to 45 minu /or English	ites) with subsequer	nt discussion on the topic of the
Allocati	ion of r	olaces			
Additio	nal inf	ormation			
Workload					
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in			
Master'	Master's degree (1 major) Aerospace Computer Science (2023)				



Aerospace Computer Science

(20 ECTS credits)

Module title			Abbreviation		
Spacecraft System Analysis			10-LURI=SSA-232-m01		
Module coordinator				Module offered by	
holder	of the C	hair of Computer Scienc	e VIII	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Introdu orbits, angle o on of th lemetry generat of spac	ction: ł disturb f incide ermal , telecc tion: so ecraft.	history of space flight, sys ance forces, transfer orbi ence. Thermal control of s designs. Telecommunica ommando). Structure anc lar cells. On-board data Ground segment.	stem design of space its. Mission analysis: satellites: thermal an tion: ground contact I mechanisms. Energ processing. Propulsio	craft. Space dynami earth and sun-syncl alysis, thermal desig analysis, data transi y systems: primary, son systems. Tests (m	cs: two-body dynamics, Kepler hronous orbits, shadows, solar gn and technologies, verificati- mission, satellite monitoring (te- secondary, management, power echanical, electrical). Operation
Intende	ed learr	ning outcomes			
The stu jor sub:	dents r system	naster system aspects of s and their integration in	the layouting of tech to a working whole a	nical systems. Using re being analysed.	g the example of spacecraft, ma-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) + Module	Ü (2) e taugh	t in: English			
Method	l 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)			
written If annou examin prox. 15 Langua credital	examir unced l 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: English bonus	minutes) 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-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Focuse: LR	s availa	able for students of the M	laster's programme lı	nformatik (Computer	Science, 120 ECTS credits): ES,
Worklo	ad				
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22 II Nr. 3 b)					
Module appears in					
Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Computer Science (2025)					

Module title			Abbreviation		
Intelligent Rocket Propulsion Systems			10-LURI=IRP-252-m01		
Module	coord	inator		Module offered by	
holder	of the Q	Chair of Computer Scienc	e VII	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	graduate			
Contents Introduction to Space Transportation and Liquid Rocket Propulsion Basics of Mathematical Modeling Modeling Examples in Space Transportation / Liquid Rocket Propulsion Basics of Rocket Engine Control and Condition Monitoring Systems Modern Approaches to Rocket Engine Control Rocket Engine Test Facilities Current & Future Developments					
Studen essenti of rocke	ts unde al proc et engin	erstand the basics of liqu esses and the control of ne test facilities and are a	id rocket propulsion. modern pump-fed ro aware of current deve	They know the chall cket engines. They h lopments.	lenges related to the modeling of ave learned about the operation
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + l	Ü (2)		- 1-		
Mothod	laugn				the second s
module is	creditab	le for bonus)	ge — II other than German, e	examination onered — if no	it every semester, mornation 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					
Allocati	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)				
 Madul-	20000	rc in			
keinem	Studie	ngang zugeordnet			

(2025)

Module title			Abbreviation			
Deep Reinforcement Learning for Intelligent Space Systems			10-I=DRLISS-252-m	01		
Module	e coord	inator		Module offered by		
Dean o	f Studio	es Informatik (Compute	r Science)	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	graduate				
Conten	ts					
 K E T P A P V A A M C Fi Intende Studen 	 Key Concepts in Reinforcement Learning Exact Methods for Finite Markov Decision Processes Tabular Reinforcement Learning Planning and Learning with Tabular Methods Approximation Methods and Deep Reinforcement Learning Policy Optimization Value-Based Methods Applying Reinforcement Learning and Practical Tips and Tricks Aerospace Applications Model-Based Reinforcement Learning Challenges Frontiers and Future of Deep Reinforcement Learning 					
del-bas rithms	ed). Th	ntinuous) control tasks	challenges and unsolv and have learned abou	ed problems. They a at aerospace applica	re able to use standa tions.	ard algo-
Course	S (type, n	umber of weekly contact hours	, language — if other than Ger	man)		
V (2) + Module	Ü (2) e taugh	t in: German and/or Eng	glish			
Methoo module is	d of ass creditab	essment (type, scope, langule for bonus)	uage — if other than German, o	examination offered — if no	t every semester, informati	on 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						
Teaching cycle: every year, summer semester						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	in				
Master's wi (2025)	ith 1 majoi	Aerospace Computer Science	JMU Würzburg • g cord Master (120 E	enerated 19-Apr-2025 • exam CTS) Luft- und Raumfahrtinfo	. reg. data re- ırmatik - 2025	page 15 / 100





keinem Studiengang zugeordnet

Module title			Abbreviation		
Orbital Mechanics				10-LURI=GRFM-232-mo1	
Module	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	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	Contents				
Founda body pi through	tions o roblem 1 obser	f orbital dynamics and or , identification of classica vation (Laplace method),	rientation dynamics o al orbit elements fron , identification of orie	of air and space vehi n initial conditions, i ntation data, rocket	cles, spherical trigonometry, two- dentification of orbit elements lift-off trajectory.
Intende	ed learr	ning outcomes			
Unders in air ar tion sys	tanding nd spac stems.	g of fundamental method ce travel. Skills to apply t	s for acquisition, pro he acquired knowled	cessing and control ge in development a	of orbit and orientation systems and analysis of orbit and orienta-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) + I	Ü (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
a) writte b) proje the top If annot examin prox. 15	en exar ect worl ic) unced l ation o 5 minut	nination (approx. 60 to 1 k (report (approx. 20 pag by the lecturer at the beg f one candidate each (ap es per candidate).	20 minutes) or es) with presentation inning of the course, prox. 20 minutes) or	(30 to 45 minutes) a the written examina an oral examination	and subsequent discussion on tion may be replaced by an oral in groups of 2 candidates (ap-
	ion of r				
		/14063			
Additio	nal inf	ormation			
Workload					
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in			
Master'	s degre	ee (1 major) Aerospace Co	omputer Science (202	23)	

Module title			Abbreviation		
Space [Space Dynamics				10-LURI=SD-202-m01
Module coordinator				Module offered by	
holder	of the Cł	nair of Computer Science	e VII	Institute of Comput	er Science
ECTS	Method	l of grading	Only after succ. com	pl. of module(s)	
5	numeri	cal grade			
Duratio	n I	Module level	Other prerequisites		
1 semes	ster g	graduate			
Conten	ts				
Fundam exampl	nental pi e realisa	rinciples of astrodynami ations, spin-stabilised s	cs, orientation contro atellites, 3-axis stabi	ol of satellites, senso lised satellites.	ors, actuators, control software,
Intende	ed learni	ng outcomes			
The stue	dents m al senso	aster the fundamentals ors and actuators as wel	of dynamic aspects o l as their areas of use	of the design of space in spaceflight.	ecraft and are familiar with the
Courses	S (type, nu	mber of weekly contact hours, la	anguage — if other than Ger	man)	
V (2) + ĺ Module	Ü (2) e taught i	in: English			
Method module is	l of asse creditable	e ssment (type, scope, languag for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written examination (approx. 90 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: English creditable for bonus					
Allocati	ion of pl	aces			
Additio	nal info	rmation			
Worklo	ad				
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master'	s degree	e (1 major) Aerospace Co	omputer Science (202	20)	
Master'	s degree	e (1 major) Aerospace Co	omputer Science (202	21)	
Master's degree (1 major) Aerospace Computer Science (2023)					

Module title				Abbreviation	
Advanced Sensory Systems and Sensor Data Processing			10-LURI=ASS-202-m01		
Module	coord	inator		Module offered by	
holder	of the C	Chair of Computer Scienc	e XVII	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	graduate			
Conten	Contents				
Advanc The sen stems a liable fa sor data	Advanced automation systems need instrumentation concepts with proprioceptive and exteroceptive sensors. The sensors can be active or passive and may be enclosed into an embedded system. Only complex sensor sy- stems and clever sensor data processing procedures ensure the tasks of satellite systems are performed in a re- liable fashion. After discussing in detail state-of-the-art sensors and sensor systems, the course focuses on sen- sor data processing for in orbit and for planetary applications.				
Intende	ed learn	ning outcomes			
Student data pro within l ded Kal vel rese and sho	ts will r ocessir ocaliza man fil earch st ould be	master modern sensor da ng concepts, like sensor o tion and mapping and st lter, Unscented Kalman F trands in this area like ma aware about the advant	ita acquisition systen data interpretation. A udents will have to d ilter, Particle filter, et achine learning conce ages and disadvanta	ns with embedded p dvanced state estim eal with linear, non- c.). Furthermore, stu epts into a scientific ges.	rocessing and several advanced ation methods will be discussed linear filters (Kalman filter, exten- dents should be able to put no- and technological perspective
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + Í Module	Ü (2) taugh	t in: German and/or Engli	ish		
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	examir unced l ation o ; minut ge of a ole for	nation (approx. 90 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-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master' Master' Master'	s degre s degre s degre	ee (1 major) Aerospace Co ee (1 major) Aerospace Co ee (1 major) Aerospace Co	omputer Science (202 omputer Science (202 omputer Science (202	20) 21) 23)	

Module title					Abbreviation
Satellite Image processing					10-LURI=SBV-232-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e VIII	Institute of Compute	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Intende	ed leari	ning outcomes			
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) +	Ü (2)				
Module	taugh	t in: German and/or Engl	ish		
Methoo module is	d 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
written If annou examin prox. 15 Langua credita	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, prox. 20 minutes) or /or English	the written examinat 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			
Worklo	ad				
300 h					
Teachir	ıg cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22	Vr. 3 b)				
Module	e appea	in			
Master	Master's degree (1 major) Aerospace Computer Science (2023)				

Module title					Abbreviation
Flight C	Control				10-LURI=FCS-252-m01
Module	e coordi	inator		Module offered by	
				Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Intende	ed learr	ning outcomes			
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) + Module	Ü (2) e taughi	t in: German and/or Engli	ish		
Method	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)			
If annot examin prox. 15 Langua credital	examir unced l 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, 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 info	ormation			
Worklo	ad				
300 h					
Teachir	ng cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	rs in			
keinem	keinem Studiengang zugeordnet				

Module title					Abbreviation
Flight G	Guidano	ce			10-LURI=FG-252-m01
Module	coord	inator		Module offered by	
				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	graduate			
Conten	ts				
Intende	ed learn	ning outcomes			
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	Ü (2)				
Module	taugh	t in: German and/or Engl	ish		
Method	l 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)	···· :···· +)		
lf annoi	examir unced l	nation (approx. 60 to 120 by the lecturer at the beg	minutes)	the written examina	tion may be replaced by an oral
examin	ation o	f one candidate each (ap	prox. 20 minutes) or	an oral examination	in groups of 2 candidates (ap-
prox. 15	5 minut	es per candidate).	/		
Langua	ge of a ble for	ssessment: German and, bonus	or English		
Allocat	ion of p	olaces			
	· ·				
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	irs in			
keinem	<pre>keinem Studiengang zugeordnet</pre>				

Module title					Abbreviation	
Selecte	ed Topi	cs in Aerospace Computi		10-LURI=SLR-232-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. com	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Selecte	ed topic	s in aerospace engineeri	ng.			
Intende	ed lear	ning outcomes				
The stu ons of	idents i comple	understand the basic app x problems in this area a	proach of aerospace e nd apply them to sim	engineering. They are iilar questions.	e able to understand the soluti-	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) +	Ü (2)					
Module	e taugh	t in: German and/or Engl	ish			
Methoe module is	d 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	
a) writt b) proje the top c) oral d) oral Langua credita	en exa ect wor ic) or examin examir ge of a ble for	mination (approx. 60 to 1 k (report (approx. 20 pag ation of one candidate en ation in groups of up to 3 ssessment: German and, bonus	20 minutes) or es) with presentation ach (approx. 20 minu 3 candidates (approx ⁄or English	i (30 to 45 minutes) a ites) or . 15 minutes per can	and subsequent discussion on didate)	
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
150 h						
Teachi	Teaching cycle					
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	e appea	in in				
Master	Master's degree (1 major) Aerospace Computer Science (2023)					





Robotics and Telematics

(20 ECTS credits)

Module title Abbreviation							
Robotic	:S 1				10-LURI=R01-232-n	101	
Module	coord	inator		Module offered by			
holder	of the (Chair of Computer Scie	nce XVII	Institute of Comput	er Science		
ECTS Method of grading Only after succ. compl. of module(s)							
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
History, homoge tor conf Worksp se dyna lonome Movem Sensors	History, applications and properties of robots, direct kinematics of manipulators: coordinate systems, rotations, homogenous coordinates, axis coordinates, arm equation. Inverse kinematics: solution properties, end effector configuration, numerical and analytical approaches, examples of different robots for analytical approaches. Workspace analysis and trajectory planning, dynamics of manipulators: Lagrange-Euler model, direct and inverse dynamics. Mobile robots: direct and inverse kinematics, propulsion system, tricycle, Ackermann steering, holonomes and non-holonome restrictions, kinematic classification of mobile robots, posture kinematic model. Movement control and path planning: roadmap methods, cell decomposition methods, potential field methods.						
Intende	ed lear	ning outcomes					
The stu their ki	dents ı nemati	master the fundamenta cs and dynamics as we	ls of robot manipulato Il as the planning of pa	rs and vehicles and a aths and task execut	are, in particular, fan ion.	niliar with	
Course	5 (type, r	umber of weekly contact hour	s, language — if other than Ge	rman)			
V (2) + I Module	Ü (2) taugh	t in: German and/or En	glish				
Method	l of ass	essment (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
module is	creditab	le for bonus)					
written If annou examin prox. 15 Langua credital	examin unced ation c ; minut ge of a ble for	nation (approx. 60 to 1: by the lecturer at the by of one candidate each (res per candidate). ssessment: German ar bonus	20 minutes) eginning of the course, approx. 20 minutes) or d/or English	the written examina an oral examination	tion may be replaced in groups of 2 cand	d by an oral idates (ap-	
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Focuses ES, LR,	s availa HCI, GI	able for students of the	Master's programme I	nformatik (Computer	Science, 120 ECTS o	credits): KI,	
Worklo	ad						
150 h							
Teachir	ng cycl	е					
Teachir	ng cycle	e: every year, winter se	nester				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	immes)			
§ 22	Vr. 3 b)						
Module	appea	ars in					
Master' Master' Master' Master'	Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024)						
(2025)	птпајо	Aerospace computer Science	cord Master (120 E	ECTS) Luft- und Raumfahrtinfo	rmatik - 2025	page 25 / 100	

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)

Module title					Abbreviation	
Roboti	CS 2				10-LURI=R02-232-n	n01
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scie	nce XVII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	ts					
Founda feedba stems: itialisin	Foundations of dynamic systems, controllability and observability, controller design through pole assignment: feedback and feed-forward, state observer, feedback with state observer, time discrete systems, stochastic systems: foundations of stochastics, random processes, stochastic dynamic systems, Kalman filter: derivation, in- itialising, application examples, problems of Kalman filters, extended Kalman filter.					ssignment: ochastic sy- erivation, in-
Intende	ed lear	ning outcomes				
The stu tions of se the o design.	idents f roboti connec . They a s (type, r	master all fundamenta cs. The students posse tions between the dua also recognise the relat	ls that are necessary to ess a knowledge of adv l pairs controllability - o ionship between the Ka s, language — if other than Ge	understand Kalman anced controller and observability as well alman filter as a state rman)	filters and their use observer methods a as controller design e estimator and an o	in applica- and recogni- and observer bserver.
V (4) + Module	Ü (2) +	P (1) t in: German and/or En	alich			
Metho			ruage if other than Corman	examination offered if no	t over competer informati	on on whother
module is	s creditab	le for bonus)	guage — If other than German,	examination onered — If no	tevery semester, mornati	on on whether
If anno examin prox. 1 <u>4</u> Langua credita	examin unced nation c 5 minut uge of a ble for	nation (approx. 60 to 1 by the lecturer at the b of one candidate each (ces per candidate). ssessment: German ar bonus	20 minutes) eginning of the course, approx. 20 minutes) or nd/or English	the written examina an oral examination	tion may be replaced in groups of 2 cand	d by an oral idates (ap-
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Focuse ES, LR,	s availa HCI, GI	able for students of the 	Master's programme I	nformatik (Computer	Science, 120 ECTS o	credits): KI,
Worklo	ad					
300 h						
Teachi	ng cycl	е				
Teachir	ng cycle	e: every year, summer s	semester			
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
§ 22	Nr. 3 b)					
Module	e appea	ars in				
Master Master Master Master Master ^{Master's wi}	Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's with 1 major Aerospace Computer Science JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re- page 27 / 100					
(2025)			cord Master (120 l	ECTS) Luft- und Raumfahrtinfo	rmatik - 2025	



Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)

Module title Abbrevia					Abbreviation	
Autono	Autonomous Mobile Systems 10-LURI=AMS-232-m01					
Modul	e coord	linator		Module offered by		
holder	of the	Chair of Computer Scier	nce XVII	Institute of Comput	er Science	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
10	nume	rical grade		• • • •		
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conter	nts	3.44440				
(1) What on (6) trol arc	at are n Localiz :hitectu	nobile robots? (2) Sense ation in maps (7) Mapp Ires	ors (3) Sensor data pro ing and SLAM (8) Navi	cessing (4) Locomot gation (9) Sensor dat	ion and kinematics (ta interpretation (10)	5) Localizati- Robot con-
Intend	ed lear	ning outcomes				
Studer cepts t ve lear Course	nts kno o mobi ned the s (type, 1	w Bayesian concepts fo le robots. Derived conc e steps to build and pro number of weekly contact hours	r sensor data processi epts like Kalman filter, gram mobile systems. 5, language – if other than Ge	ng for a mobile syste Particle filter, POMD rman)	em and are able to ap PS, etc. are understo	oply the con- ood. They ha-
V (4) + Module	Ü (2) e taugh	t in: German and/or En	glish			
Metho module i	d of as s creditat	sessment (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
lf anno examir prox. 1 Langua credita	nation of a minuted to the second sec	by the lecturer at the be of one candidate each (tes per candidate). Issessment: German an bonus	eginning of the course, approx. 20 minutes) of d/or English	the written examina an oral examination	tion may be replace in groups of 2 cand	d by an oral idates (ap-
Allocat	tion of	places				
Additio	onal inf	ormation				
Focuse KI, ES,	es avail LR, GE	able for students of the	Master's programme I	nformatik (Compute	r Science, 120 ECTS (credits): IT,
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Teachi	ng cycl	e: every year, summer s	emester			
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
§ 22	Nr. 3 b)					
Modul	Module appears in					
Master	Master's degree (1 major) Computer Science (2023)					
Master	's degr	ree (1 major) Aerospace	Computer Science (20	23)		
Master	's degr	ee (1 major) Artificial In	telligence & Extended	Reality (2024)		
Master	's degr	ee (1 major) Artificial In	telligence (2024)			
Master	's degr	ee (1 major) Computati	onal Mathematics (202	24)		
Master	's degr	ee (1 major) Mathemati	cs (2024)			
Master	's degr	ee (1 major) Computer S	Science (2025)			
Master's w	ith 1 maio	r Aerospace Computer Science	IMH Würzhurσ●o	enerated 10-Apr-2025 • exam	n, reg. data re-	page 20 / 100
(2025)			cord Master (120	ECTS) Luft- und Raumfahrtinfo	ormatik - 2025	

Module title					Abbreviation
3D Point Cloud Processing					10-LURI=3D-202-m01
Module	coord	inator		Module offered by	
holder	of the C	Chair of Computer Scienc	e XVII	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	graduate			
Conten	ts				
Laser s d trees, mappir	cannin; , registi 1g.	g, Kinect and camera moo ration, features, segment	dels, basic data struc ation, tracking, appli	tures (lists, arrays, c cations for airborne	oc-trees), calculating normals, k- mapping, applications to mobile
Intende	ed learr	ning outcomes			
Studen munica data pr require	ts unde te with ocessir ments,	erstand the fundamental engineers / surveyors / ng and have experienced in terms of memory requ	principles of all aspe CV people / etc. Stud that real application irements and in term	cts of 3D point cloud ents are able to solv scenarios are challe s of implementation	d processing and are able to com- ve problems of modern sensor enging in terms of computational issues.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + Module	Ü (2) e taugh	t in: German and/or Engli	ish		
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 annou examin prox. 15 Langua credital	examir 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 res 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			
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module	e appea	nrs in			
Master Master Master	Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020) Master's degree (1 major) Aerospace Computer Science (2021)				
Master'	's degre	ee (1 major) Aerospace Co	omputer Science (202	23)	
master	Master's degree (1 major) Artificial Intelligence & Extended Reality (2024)				

Module title					Abbreviation
Photog	ramme	etric Machine Vision			10-LURI=PHOTO-232-mo1
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e XVII	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	graduate			
Conten	ts				
(1) Wha Transfo rect (10 Corresp	t is Pho rm (6)) Iterat	otogrammetry? (2) Camer Spatial Resection (7) Rela ive-Solution (11) Triangul g Points (16) Matching	as (3) Homogeneous ative Orientation and ation (12) Multiview (Coordinates (4) Can Fundemental Matrix 13) Aerial photograp	nera Parameter (5) Direct Linear (8) Epipolar Geometry (9) FE-di- hy (14) Orthophoto (15) Finding
Intende	ed leari	ning outcomes			
Student calculat ter visio	ts unde te 3D ir on.	erstand that photogramm nformation from 2D imag	etry means measurir es and are able to eva	ng in and with photo aluate accuracies. Th	s. They have learned the steps to ne know the limits of 3D compu-
Courses	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + l Module	Ü (2) e taugh	t in: German and/or Engli	ish		
Method module is	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 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	nal inf	ormation			
Worklo	ad				
150 h					
Teachir	ıg cycl	е			
Teachir	ng cycle	e: every year, winter seme	ester		
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22 N	Vr. 3 b)				
Module	appea	ins in			
Master' Master' Master'	Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024)				

Module tit	le	Abbreviation			
Telecommu	unication Systems		10-l=TSD-232-m01		
Module co	ordinator		Module offered by		
Dean of Stu	udies Informatik (Computer S	Science)	Institute of Comput	er Science	
ECTS Me	ethod of grading	Only after succ. com	pl. of module(s)		
10 nu	merical grade				
Duration	Module level	Other prerequisites			
1 semester	r graduate				
Contents					
 Signa Digita Binal Deter Digita Multi Chan Netw Furth Intended lease Students was and relearn gain plitue under tiona beco in wi 	 Introduction Signals and Linear Systems Digital Representation of Analog Signals Binary Baseband Modulation Detection of Binary Baseband Signals in Noise Digital Modulation Multicarrier Modulation Multicarrier Modulation Channel Coding Networks and Protocols Further Topics Intended learning outcomes Students will grasp the concepts and techniques of sampling, quantisation and pulse shaping for signal transmission and reception, learn how to detect and decode signals in the presence of noise, gain knowledge of higher order modulation schemes and their applications, including Quadrature Amplitude Modulation (QAM) and Frequency Shift Keying (FSK), understand the basics of error control coding, such as forward error correction (FEC) codes and convolutional codes, and their role in enhancing data reliability and 				
Courses (typ	pe, number of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + Ü (2 Module tau	2) ught in: German and/or Engli	ish			
Method of module is cred	assessment (type, scope, langua ditable for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
written exa If announce examinatio prox. 15 mi Language c creditable	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				
Focuses av	vailable for students of the M	aster's programme Ir	nformatik (Computer	Science, 120 ECTS credits): LR	
Workload					
300 h					

Teaching cycle

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023)

Master's degree (1 major) Aerospace computer Science (202 Master's degree (1 major) Computer Science (2025)

Module title					Abbreviation
Selected Topics in Robotics and Telematics					10-LURI=SRT-232-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Computer Scienc	e XVII	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Selecte	ed topic	s in robotics and telemat	tics		
Intende	ed lear	ning outcomes			
The stu ons of	idents i comple	understand the basic app x problems in this area a	proach of robotics and nd apply them to sim	d telematics. They ar iilar questions.	e able to understand the soluti-
Course	S (type, r	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	Ü (2)				
Module	e taugh	t in: German and/or Engl	ish		
Metho module is	d of ass s creditab	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) writt b) proje the top c) oral d) oral Langua credita	en exa ect wor ic) or examin examir age of a ble for	nination (approx. 60 to 1 k (report (approx. 20 pag ation of one candidate e lation in groups of up to <u>3</u> ssessment: German and, bonus	20 minutes) or es) with presentation ach (approx. 20 minu 3 candidates (approx ⁄or English	i (30 to 45 minutes) a ites) or . 15 minutes per can	and subsequent discussion on didate)
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
150 h					
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
Master	Master's degree (1 major) Aerospace Computer Science (2023)				

Module title Abbreviation							
Remote	e Sensi	ng			10-l=RRS-232-m01		
Module	e coord	inator		Module offered by			
holder	ofthe	Chair of Computer Scier	nce VIII	Institute of Comput	er Science		
ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
	stor	graduate					
Conten	Contants						
Remote on Eart magnet aircraft flectior	e sensi h, inclu tic radi and its of sur	ng refers to the use of s uding on the surface an ation). It may be split ir s reflection by the objec nlight is detected by the	atellite- or aircraft-based d in the atmosphere an to "active" remote sen at is detected by the se sensor).	ed sensor technolog nd oceans, based on sing (i.e., when a sig nsor) and "passive"	ies to detect and cla propagated signals gnal is emitted by a s remote sensing (i.e.,	ssify objects (e.g. electro- satellite or , when the re-	
Intende	ed lear	ning outcomes					
The stu sphere mote se	idents to the ensing	learn the basics of eartl object under investigat data, sensors and platt	n observation. They ou ion and back to the ser forms.	tline and explain the nsor. They emphasiz	e radiation path throu e essential characte	ugh the atmo- ristics of re-	
Course	S (type, r	number of weekly contact hours	s, language — if other than Gei	rman)			
V (2) + Module	Ü (2) e taugh	t in: German and/or En	glish				
Metho	d of ass	sessment (type, scope, lang	uage — if other than German,	examination offered — if no	ot every semester, informati	ion on whether	
module is	s creditab	le for bonus)					
If anno examin prox. 1 <u>4</u> Langua credita	exami unced nation c 5 minut 1ge of a ble for	nation (approx. 60 to 12 by the lecturer at the be of one candidate each (tes per candidate). Issessment: German an bonus	20 minutes) eginning of the course, approx. 20 minutes) or d/or English	the written examina an oral examination	tion may be replaced i in groups of 2 cand	d by an oral idates (ap-	
Allocat	ion of _l	places					
Additio	onal inf	ormation					
possib	le maic	ors for MA 120 Compute	r Science: LR.IN				
Worklo	ad	· · · ·					
150 h							
Teachi	ng cycl	e					
Teachir	ng cycle	e: every year, summer s	emester				
Referre	d to in	IPOI (examination regulation	ons for teaching-degree progra	mmes)			
8 22 II I	Nr ah)						
Module	a annea	arc in					
Mastor	Module appears in						
Master	's degr	ee (1 major) Computer 3	telligence & Extended	Reality (2024)			
Master	's degr	ee (1 major) Artificial In	telligence (2024)				
Master	's degr	ee (1 major) Computatio	onal Mathematics (202	4)			
Master	's degr	ee (1 major) Mathemati	cs (2024)	12			
Master	's degr	ee (1 major) Computer S	Science (2025)				
		•					
Master's wi (2025)	ith 1 majo	r Aerospace Computer Science	JMU Würzburg ● g cord Master (120 E	enerated 19-Apr-2025 • exam CCTS) Luft- und Raumfahrtinfo	1. reg. data re- ormatik - 2025	page 35 / 100	

Module title					Abbreviation
Quantum Communications 10-I=QC-261-m01					
Module coordinator				Module offered by	
holder of the Chair of Computer Scienc			e VII Institute of Computer Science		
ECTS Method of grading		Only after succ. compl. of module(s)			
5 numerical grade					
Duration Module level		Other prerequisites			
1 semester graduate		graduate			
Contents					
 Hilbert Spaces and Operators Quantum Mechanics Quantum States Quantum Circuit Elements Entanglement and Its Applications Quantum Key Distribution Quantum Channel Quantum Error Correction Coding Continuous-Variable Quantum Communications Further Topics 					
Intended learning outcomes					
 develop a solid foundation in quantum information technology, including qubits, quantum gates, entanglement, and quantum measurements, learn about secure communications using quantum mechanics, including protocols like Quantum Key Distribution (QKD), gain familiarity with protocols such as quantum teleportation, superdense coding and error correction, and understand the effects of noise and decoherence in quantum communications and learn strategies to mitigate their impact. 					
Courses (type, number of weekly contact hours, language — if other than German)					
V (2) + Ü (2) Module taught in: German and/or English					
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					
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR					
Workload					
150 h					
Teaching cycle

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

keinem Studiengang zugeordnet



Practica Aerospace Computer Science

(20 ECTS credits)

Module title					Abbreviation
Space Systems Design					10-LURI=RSE-232-m01
Module	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	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
In the c craftsys from th lunar p	ourse o stem is e area henom	of a semesterproject, a sp done anew each semest of microsatellites, like "d enons (TLP)".	bacecraft system will er and draws inspirat esign of a nanosatell	be designed in a tea ion from current trer itemission for detec	nm. The selection of the space- nds and concrete research, often tion and observation of transient
Intende	ed learr	ning outcomes			
The stu elemen help of design will be t	dents g tary de the acc in the a trained	gain fundamental knowle sign aspects, create requ quired knowledge of met area of spacecraft system	dge about the desigr uirements accordingly hods they are able to is. Also projectmanag	n of spacecraft system y and consider them create dedicated to gement for the devel	ms. They are able to analyse the in their system design. With the ols and methods to support the opment of spacecraft systems
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
R (8) Module	taugh	t in: German and/or Engl	ish		
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
project Langua Assessi	report ge of a ment o	(10 to 15 pages) and pres ssessment: German and, ffered: In the semester in	sentation of project (1 /or English which the course is	5 to 30 minutes) offered	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module	appea	irs in		<u>`</u>	
Master's degree (1 major) Aerospace Computer Science (2023)					

Module title					Abbreviation	
Design of Planetary Bases and Orbital Stations					10-LURI=EPB-232-m01	
Module	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	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
plannin compor se etc) constru product ly layed	of futuring of planets linents	anetary bases. This will the satellites. The content of the satellites. The content of the satellites are satellites. The content of the satellites are satellites. The content of the satellites. The content of the satellites are satellites. The content of the satellites are satellites. The satellites are satellites. The content of the satellites are satellites. The satellites are satellites. The satellites are satellites. The satellites are satellites. The content of the satellites. The satellites are satellites. The content of the satellites. The satellites are satellites are satellites. The satellites are satellites. The satellites are satellites are	rain the planning of a t will be decided upo e motivation, goals, p planning of modules nd moon as well as m	n this lecture will for very complex space n each semester (for rerequisites, constra and structures, lifes obility on the surfac	ecraft apart from its individual r example lunar base, mars ba- aints, environment, localization, upport, energy, communication, e of the moon will be conceptual-	
Intende	ed leari	ning outcomes				
The stu le to an support the plan planeta	dents g alyse t t of the nning i ary base	gain fundamental knowle he elementary aspects of acquired knowledge of r n the area of planetary ba es and orbital stations wi	dge about the planni planning, pose requ nethods they are able ases and orbital stational ll be trained.	ing of planetary base irements and consic e to create dedicated ons. Also projectman	es and orbital bases. They are ab- ler the system design. With the d tools and processes to support nagement for the development of	
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R (8) Module	taugh	t in: German and/or Engli	ish			
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	
project Langua Assessi	report ge of a ment o	(10 to 15 pages) and pres ssessment: German and/ ffered: In the semester in	entation of project (1 ′or English which the course is	5 to 30 minutes) offered		
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h	300 h					
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	irs in)		
Master'	Master's degree (1 major) Aerospace Computer Science (2023)					

Module title Abbreviation					Abbreviation	
Practical course - Space Technology					10-LURI=PRT-232-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studie	es Informatik (Computer	Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
In this i analysi perime	nterns s of roo nts and	hip, students are suppos cket experiments (includi I their payloads.	ed to acquire practicand to acquire practicand to acquire payload). The	al experience in the e goal is the design,	design, building, execution and building and testing of rocket ex-	
Intende	ed learı	ning outcomes				
The stu ge abou mentar the aid jects.	dents § ut rocko y desig of the	gain fundamental knowle et science, including laur n aspects of rocket paylc acquired methodic know	dge about the desigr och preparations as w bads, pose according ledge, they are able t	n of spacecraft exper vell as the execution requirements and re o apply dedicated to	iments, fundamental knowled- . They are able to analyse the ele- espects those in the design. With ools and method in bigger pro-	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
P (8) Module	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	t every semester, information on whether	
placem Langua	ent rep ge of a	oort (10 to 15 pages) and ssessment: German and,	presentation of result or English	s (15 to 30 minutes)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h	300 h					
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	nrs in				
Master	Master's degree (1 major) Aerospace Computer Science (2023)					

Module title				Abbreviation		
Aircraft Construction					10-LURI=FZB-232-m01	
Module coordinator Module offered b			Module offered by			
holder	of the C	hair of Computer Scienc	e VIII	Institute of Compute	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
2 seme	ster	graduate				
Conten	ts					
 A e S Ta Q D B N 	ssemb lement etting u asks ar uality a ocume uilding larketir	ly of a RV12 small airplan s of the RV12 (aluminum up a project team ad allocation of responsil assurance ntation of the work some elements of the R ¹ ng and PR activities	e processing) bilities V12			
Intende	ed learr	ing outcomes				
Student comple aircraft stems a	ts have x and s constru and alu	the necessary soft skills safety-critical projects. St uction. Students practice minum processing.	, project managemer udents have technica manual skills in rele	nt knowledge and ex al, theoretical and pr vant areas of aircraft	perience for the execution of actical knowledge concerning t construction e.g. electrical sy-	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R (8) Module	taugh	t in: German and/or Engl	ish			
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	
project Langua credital	report ge of a ble for	(10 to 15 pages) and pres ssessment: German and, bonus	entation of project (1 ′or English	5 to 30 minutes)		
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	Workload					
300 h	300 h					
Teachir	ng cycl	e				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	rs in				
Master's degree (1 major) Aerospace Computer Science (2023)						

Module title Abbreviation					Abbreviation	
Flight Simulator					10-LURI=FSIM-232-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)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
2 seme	ster	graduate				
Conten	ts					
Layout route e	of A320 ntry, fli	o cockpit, instruments in ght execution, taxing, tal	a a320 cockpit, fligh ke-off, flight, landing,	t preparations, cold taxing, anomalies a	and dark start of an a320, flight nd emergencies	
Intende	ed leari	ning outcomes				
The stu Importa	dents ant: thi	possess the technical, th s is no licence to fly and i	eoretical and practica t's not a pilote traini	al knowledge and sk ng.	ills to do a flight with an a320.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
R (8) Module	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	t every semester, information on whether	
project Langua credita	report ge of a ble for	(10 to 15 pages) and pres ssessment: German and bonus	sentation of project (1 /or English	15 to 30 minutes)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h	300 h					
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Module	appea	ars in				
Master	's degr	ee (1 major) Aerospace C	omputer Science (20:	23)		

Module title					Abbreviation	
UAS Operations					10-LURI=UAS-252-m01	
Module	e coord	inator		Module offered by		
				Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
2 seme	ster	graduate				
Conten	ts					
Intende	ed learr	ning outcomes				
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R (8) Module	taugh	t in: German and/or Engli	ish			
Method	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)				
project Langua credita	report ge of a ble for	(10 to 15 pages) and pres ssessment: German and, bonus	sentation of project (1 /or English	5 to 30 minutes)		
Allocat	ion of p	olaces				
	· · ·					
Additio	nal info	ormation				
Worklo	ad					
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	in and the second se				
keinem Studiengang zugeordnet						

Module title					Abbreviation
Practical Robotics and Telematics					10-LURI=PTEL-232-m01
Module	coord	inator		Module offered by	
holder	of the O	Chair of Computer Scienc	e XVII	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
and cor allow to and aut stance process	nterns nputer o offer e comatic and to sing - s	nip, students develop int science. The great advar ever more sophisticated s on techniques in the field react accordingly. Possib pace flight	erdisciplinary solution acements in the fields services over long dis of telematics, new p ale focus topics: - auto	ons from the fields te s of telecommunicat stances. By combinir ossibilities arise to a omation, industry 4.	iecommunication, automation ion and informationprocessing ig these disciplines with control acquire data remotely from a di- o - mobile systems, sensor data
Intende	ed learr	ning outcomes			
In this i mation react w exampl Course	nterns system ith acti e the R s (type, n	hip, students gather and ns or mobile robots. They ons accordingly. They lea obot Operating System (umber of weekly contact hours, I	deepen their skills in learn acquiring fittin arn programming clos ROS). anguage — if other than Ger	developing telecom g sensor data and ev e to the hardware an man)	nmunication solutions for auto- valuate it online (in realtime) and nd master common libraries, for
P (8) Module	taugh	t in: German and/or Engl	ish		
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
Report on the t Langua	on prac topic ge of a	tical course (approx. 20 ssessment: German and,	pages) with presenta /or English	tion (30 to 45 minut	es) and subsequent discussion
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	irs in		<u>`</u>	
Master'	s degre	ee (1 major) Aerospace Co	omputer Science (202	23)	

Module title					Abbreviation	
Team Design Project					10-LURI=TDP-232-m01	
Module coordinator Module offered				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)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Multi-d and sof	isciplir ftware.	ary project in the area of In this context, current a	aerospace that cove nd relevant topics fro	rs areas such as mee m research are revie	chanical components, electronics ewed.	
Intende	ed learı	ning outcomes				
Studen and che	ts will eck the	practise reviewing compl ir work. At the end of the	ex topics in interdisc course, they will hav	iplinary teams. They e created a complete	will be required to plan, execute ely functional system.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R (8) Module	e taugh	t in: German and/or Engl	ish			
Method 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 topic) Langua	work (i	report (approx. 20 pages) ssessment: German and,	with presentation (3	o to 45 minutes) and	d subsequent discussion on the	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h	300 h					
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	in and the second se				
Master	Master's degree (1 major) Aerospace Computer Science (2023)					

Module title					Abbreviation	
FloatSat Design Lab					10-LURI=FDW-232-m01	
Module	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	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
CanSat Master mechar ry proje al platfe segmer commu structio	(now k studen nical er ect that orm to nt contr nicatio on.	nown as FloatSat) is an i nts. It is designed for stuc ngineering, aerospace teo requires knowledge and combine all available ski rol software and the grou n: space segment - groun	nterdisciplinary proje lents with different ba chnology, physics, ma skills in this as well a lls in a single project nd segment control s nd segment, electrica	ect designed - not on ackgrounds, e.g. in athematics. A satelli as in numerous othe . It covers the desigr oftware: telemetry a l subsystem (energy	Ily - for Aerospace Engineering computer science, electronics, te project is an interdisciplina- r fields. CanSat is thus an ide- n and development of the space nd telecommanding in wireless by batteries), mechanical con-	
Intende	ed learr	ning outcomes				
The stu payload CanSat ged cor process mands	dents a d (came "satell mmand sing an and to	are able to build and inte era) and attitude control ite" includes a real-time (s), telemetry (real time a d radio links communica get and (graphically) dis	grate into the inside of devices: Gyros and re operating system (pro nd history data), attit tion. The ground segn play the telemetry.	of the sphere the po- eaction wheel of a pi- ovided by us), comm ude control, power of ment ought to be abl	wer unit, a control computer, a co satellite. The software of a nanding (immediate and time-tag- control, payload control, image le to generate and send telecom-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R (8) Module	e taugh	t in: German and/or Engl	ish			
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 on (app Langua	al proje prox. 20 ge of a	ect: development, constru pages) with presentatio ssessment: German and,	uction and presentati n (30 to 45 minutes) /or English	on of a satellite cont and subsequent dis	rol system (project documentati- cussion on the topic)	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	irs in		<u>`````````````````````````````````````</u>		
Module	e studie 's door	es (Master) Aerospace Co	mputer Science (202	1)		
masier s degree (1 major) Aerospace computer science (2023)						

Module title					Abbreviation	
Teleco	mmuni	cation Systems Lab			10-I=TEL-232-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)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Its					
The stu • s • n • ja • f • c	idents i atellite ion-terr oint coi ree-spa juantur	realise projects in popula communications, restrial and highly dynam mmunications and sensir ace optical communicatio n communications.	r research areas of te ic networks, ng, ns and	elecommunications l	ike, e.g.,	
Intend	ed lear	ning outcomes				
Studen g a r a r e	 Students will gain experience in project planning, organising tasks, setting goals, and managing project timelines, apply problem-solving strategies and critical thinking skills to overcome project challenges and find innovative solutions, develop effective teamworking skills, including communication, coordination and cooperation within a project team, acquire and enhance technical skills and knowledge relevant to the project's subject matter and requirements and 					elines, nd find in- n within a and requi- audiences.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	man)		
R (8) Module	e taugh	t in: German and/or Engl	ish			
Metho module is	d of ass s creditab	Sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	t every semester, informati	ion on whether
a) oral b) oral c) repo Langua	examin examir rt (4 to age of a	aation of one candidate e nation in groups (max. 3 c 8 pages) ssessment: German and,	ach (approx. 20 minu candidates, approx. 1 /or English	ites) or 5 minutes each) or		
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Focuse	s availa	able for students of the N	laster's programme l	nformatik (Computer	Science, 120 ECTS o	credits): LR
Worklo	ad					
300 h						
Teaching cycle						
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master Master	's degr	ee (1 major) Computer Sc ee (1 major) Aerospace Co	ience (2023) omputer Science (20	23)		
Master's w	ith 1 major	r Aerospace Computer Science	JMU Würzburg • g cord Master (120 E	enerated 19-Apr-2025 • exam CTS) Luft- und Raumfahrtinfo	. reg. data re- prmatik - 2025	page 48 / 100





Module title Abbreviation					Abbreviation	
Embedded Systems in Robotics and Space Technology10-LURI=ESRR-232-mo1					10-LURI=ESRR-232-m01	
Module coordinator Module offered				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)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Comple	etion of	a practical task.				
Intende	ed learr	ning outcomes				
The pra technol	ctical e logy/ro	enables the participants t botics.	o implement an emb	edded system for ar	application in the field of space	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R (8) Module	taugh	t in: German and/or Engl	ish			
Method	l of ass	sessment (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)				
Practica (approx Langua	al proje k. 20 pa ge of a	ect: development, constru ages) with presentation (ssessment: German and,	action and presentati 30 to 45 minutes) and /or English	on of an embedded I subsequent discus	system (project documentation sion on the topic)	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
300 h						
Teachir	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	ins in				
Master's degree (1 major) Aerospace Computer Science (2023)						

Module title					Abbreviation
International Project Workshop					10-I=IPW-232-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	graduate			
Conten	ts				
The stu current	dents l resear	earn about modern meth ch are taught from the ba	ods of aerospace inf sics to current devel	ormatics. Topics that opments in applicati	t represent the central content of on.
Intende	ed leari	ning outcomes			
The stu the resp	dents l pective	know the current method scientific problem.	s of aerospace inforn	natics and are able to	o find the appropriate method for
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
R (6) Module	taugh	t in: English			
Method	l 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)			
a) writte b) pract quent d c) oral e d) oral e Langua	en exar tical pr liscuss examin examin ge of a	nination (approx. 60 to 9 oject (project documenta ion on the topic) or ation of one candidate ea ation in groups of up to g ssessment: English	o minutes) or tion (approx. 20 pag ach (approx. 20 minu 3 candidates (approx	es) with presentatior tes) or . 15 minutes per cano	n (30 to 45 minutes) and subse- didate)
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Project	will be	block taught, 4 - 6 weeks	5		
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	in and a second s			
Master's degree (1 major) Aerospace Computer Science (2023)					



Computer Science and Applications

(15 ECTS credits)

Computational Geometry nol=AG-232-mo1 Module correlation Module offered by Institute of Computer Science Institute of Computer Science ECTS Method of grading Only after succ. compL of module(s) 5 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Institute of computer science - for example robotics, computer graphics, virtual reality and geographic in-formation systems it is necessary to store, analyse, create or manipulate spatial data. This class is about the algorithm agorithm is aspects of these stacks: We will acquire techniques that are needed to plan and analyse geometric algorithm. Subjects of these stacks: We will acquire techniques that are needed to plan and analyse geometric algorithm. Subjects of these stacks: We will acquire techniques that are needed to plan and analyse geometric subjects or these stacks: We will acquire techniques acquire than the weeded to plan and analyse geometric solutions based on the concepts and techniques acquired in the lecture. Courses Supeo, number of weekly contat hours, language – if other than German) V(2) + 0 (2) Wethod of assessment type, scope, language – if other than German) V(2) + 0 (2) Wethod of assessment type, scope, language – if other than German) V(2) + 0 (2) Wethod of assessment type, scope, language – if other than German) V(2) + 0 (2) Weth	Module title					Abbreviation	
Mode Mode <t< td=""><td colspan="5">Computational Geometry 10-I=AG-232-mo1</td><th></th></t<>	Computational Geometry 10-I=AG-232-mo1						
holder of the Chair of Computer Science I Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) s numerical grade	Module	coord	inator		Module offered by		
ECTS Metities Only after succ. compl. of module(s) 5 numerical grade - Duration Module level Other prequisites 1 - - Commany areas of computer science - for example robotics, computer graphics, virtual reality and geographic information systems it is necessary to store, analyse, create or manipulate spatial data. This class is about the algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric algorithmic aspects and techniques acquired in the tecture. Intended learning Voltageometric algorithmic on gave persons and to come up with their own efficient solutions based on the concepts and techniques acquired in the tecture. Course Vipe, number of weeky contact hours, language – if other than German) V (2) + 0 (2) Method for boxins Voltageometric algorithmic on a given geometric algorithmic on faperox. So to 120 minutes). If anounced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of nea 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 gro	holder o	of the O	Chair of Computer Scien	nce l	Institute of Comput	er Science	
5 numerical grade Duration Module level Other prerequisites 1 semester graduate In many areas of computer science for example robotics, computer graphics, virtual reality and geographic information systems it is necessary to store, analyse, create or manipulate spatial data. This class is about the algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric algorithmic and analyse geometric algorithmic and analyse geometric algorithmic and data structures. Every technique will be illustrated with a problem in the practical areas listed above. Intended learming outcomes The students are able to decide which algorithms or data structures are suitable for the solution of a given geometric problem. The students are able to analyse new problems and to come up with their own efficient solutions based on the concepts and techniques acquired in the lecture. Courses tippe, number of weekly contact hours, language – if other than Geman. V(2) + U(2) Method of agerox. Go to 120 minutes). If announced by the lecture 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. 10 minutes). Inanounced by the lecture 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. 10 minutes). Inguine s	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
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The students are able to decide which algorithms or data structures are suitable for the solution of a given geo- metric problem. The students are able to analyse new problems and to come up with their own efficient solutions based on the concepts and techniques acquired in the lecture. 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) 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) Witten 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 creditable for bonus Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,HCI,GE,IN Workload 150 h Referred to in LPO 1 (examination regulations for teaching-degree programmes) § 22 II Nr. 3 b) Module appears in Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computer Science (2023) Master's degr	Intende	ed leari	ning outcomes				
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Master's with 1 major Aerospace Computer Science JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re- cord Master (120 ECTS) Luft- und Raumfahrtinformatik - 2025 page 53 / 100	Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)						
	Master's wit (2025)	th 1 majoi	Aerospace Computer Science	JMU Würzburg ● ge cord Master (120 E	enerated 19-Apr-2025 • exam CTS) Luft- und Raumfahrtinfo	. reg. data re- prmatik - 2025	page 53 / 100





Master's degree (1 major) Mathematical Data Science (2025)

Module title				Abbreviation			
Databases 2					10-I=DB2-242-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. con	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
Data wa	arehou	ses and data mining; wel	o databases; introdu	ction to Datalog.			
Intende	ed leari	ning outcomes					
The stu	dents l	nave advanced knowledg	e about relational da	tabases, XML and da	ata mining.		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) + I Module	Ü (2) e taugh	t in: German and/or Engli	ish				
Method module is	l of ass 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 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					
Focuse: KI, HCI	s availa	able for students of the M	aster's programme l	nformatik (Computer	Science, 120 ECTS credits): SE,		
Worklo	ad						
150 h							
Teachir	ıg cycl	e					
Teachir	ng cycle	e: every year, summer ser	nester				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
§ 22	§ 22 II Nr. 3 b)						
Module	Module appears in						
Master' Master' Supple	s degro s teacl mentar	ee (1 major) Artificial Inte ning degree Gymnasium I y course MINT Teacher Ec	lligence (2024) MINT Teacher Educat ducation PLUS, Elite I	on PLUS, Elite Netwo Network Bavaria (ENI	ork Bavaria (ENB) (2025) B) (2025)		

Module	title				Abbreviation	
Data Science 10-I=DM-232-m01						
Module	coord	inator		Module offered by		
holder	of the (Chair of Computer Scien	nce X	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	graduate				
Conten	ts					
Founda model, method SVM), l	tions ii relatio ls (clus earninន្	n the following areas: c nship to data warehou ter- and association m g methods for special d	lefinition of data mining se and OLAP data prepi ethods), supervised lea ata types, further learn	g and knowledge, di rocessing, data visua arning (e. g. Bayes cl ing paradigms.	scovery in databases alisation, unsupervis assification, KNN, de	s, process sed learning ecision trees,
Intende	ed learı	ning outcomes				
The stu ta minin the kno or imple	dents p ng and wledge ementa	possess a theoretical a machine learning. The e acquired in this cours ation of data mining alg	nd practical knowledge y are able to solve prac e and by using the KDE porithms.	of typical methods tical knowledge disc process. They have	and algorithms in th overy problems with acquired experience	e area of da- 1 the help of e in the use
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ger	man)		
V (2) +	Ü (2)					
Methoo module is	l of ass	essment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on 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).						
credital	ble for	bonus				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Focuses KI, HCI,	s availa GE, SE	able for students of the C, IN	Master's programme Ir	nformatik (Computer	Science, 120 ECTS o	redits): IT,
Worklo	ad					
150 h						
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Module	appea	urs in				
Module appears in Master's degree (1 major) Information Systems (2019) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Management (2024) Master's degree (1 major) Information Systems (2024) Master's degree (1 major) Economathematics (2024)						
(2025)	arimaju	Acrospace computer science	cord Master (120 E	CTS) Luft- und Raumfahrtinfo	rmatik - 2025	page 50 / 100

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Management (2025) Master's degree (1 major) Computer Science (2025) Master's degree (1 major) Economathematics (2025)

Module title					Abbreviation		
Advanced Programming 10-I=APR-252-m01					10-I=APR-252-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	graduate					
Conten	ts						
With th grams. and coo de a se cussed	e know If more de dup nsible	ledge of basic programm complex problems are to licates occur. In this lectu structure. Also, further to	ing, taught in introdu o be tackled, subopti ire, further knowledg pics in the areas of s	actory lectures, it is p mal results like long e is to be conveyed o oftware security and	possible to realize simpler pro- r, incomprehensible functions on how to give programs and co- parallel programming are dis-		
Intende	ed learr	ning outcomes					
Studen ges and ced cul	ts learr d their e minatir	n advanced programming efficiency measured usin ng in the use of GPU arch	paradigms. Different standard metrics. Ir itectures for extremel	t patterns are then in n addition, parallel p ly quick processing.	nplemented in multiple langua- processing concepts are introdu-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) +	Ü (2)						
Methoo module is	d 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		
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					
Additio	nal info	ormation					
Focuses KI, LR, H	s availa HCI, ES	able for students of the N , GE, SEC, IN	laster's programme lr	nformatik (Computer	Science, 120 ECTS credits): SE,		
Worklo	ad						
150 h							
Teachir	ıg cycl	e					
Teachir	ng cycle	e: every year, winter seme	ester				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
Module	e appea	in and a second s					
Master's degree (1 major) Information Systems (2025)							
Master'	's degre	ee (1 major) Computer Sc	ience (2025)				

Module title				Abbreviation			
Security of Software Systems 10-I=SSS-232-m01							
Module coordinator Mo				Module offered by			
holder	of the (Chair of Computer Scier	nce II	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	graduate					
Conten	Its						
dern co the foll • x • R • V • E • S	 The lecture provides an overview of common software vulnerabilities, state-of-the-art attack techniques on modern computer systems, as well as the measures implemented to protect against these attacks. In the course, the following topics are discussed: x86-64 instruction set architecture and assembly language Runtime attacks (code injection, code reuse, defenses) Web security Blockchains and smart contracts Side-channel attacks 						
Intend	ed lear	ning outcomes					
Studer cepts s ses allo tive.	nts gain such as ow stuc	a deep understanding blockchains. The lectu lents to gain hands-on	of software security, fr re prepares for researc experience with attack	om hardware and lov h in the area of secu s and analysis of sys	w-level attacks to mo rity and privacy, whi tems from an attack	odern con- le the exerci- cer's perspec-	
Course	S (type, r	number of weekly contact hours	s, language — if other than Ge	rman)			
V (2) +	Ü (2)						
Module	e taugh	t in: English					
module i	a or ass s creditab	Sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
written If anno examir prox. 1 Langua credita	examin unced nation c 5 minut age of a ble for	nation (approx. 60 to 12 by the lecturer at the be of one candidate each (tes per candidate). ssessment: English bonus	20 minutes) eginning of the course, approx. 20 minutes) or	the written examina an oral examination	tion may be replaced in groups of 2 cand	d by an oral idates (ap-	
Allocat	ion of p	olaces					
Additio	onal inf	ormation					
Focuse SE,KI,L	s availa R, HCI,	able for students of the ES, SEC,IN	Master's programme I	nformatik (Computer	Science, 120 ECTS o	credits):	
Worklo	ad						
150 h							
Teachi	ng cycl	e					
Teachi	ng cycle	e: every year, summer s	emester				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)			
§ 22	Nr. 3 b)						
Module	e appea	ars in					
Module	e studie	es (Master) Computer S	cience (2019)				
Master's w (2025)	ith 1 majo	r Aerospace Computer Science	JMU Würzburg • g cord Master (120 f	enerated 19-Apr-2025 • exam ECTS) Luft- und Raumfahrtinfo	. reg. data re- rmatik - 2025	page 59 / 100	

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Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Information Systems (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Computer Science (2025)

Module title				Abbreviation		
Multim	Multimodal User Interfaces 10-HCI=MMUI-161-m01					
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scienc	e IX	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	graduate				
Conten	ts					
Contents The multimodal interaction paradigm simultaneously uses various modalities like speech, gesture, touch, or gaze, to communicate with computers and machines. Basically, multimodal interaction includes the analysis as well as the synthesis of multimodal utterances. This course concentrates on the analysis, i.e., the input processing. Input processing has the goal to derive meaning from signal to provide a computerized description and understanding of the input and to execute the desired interaction. In multimodal systems, this process is interleaved between various modalities and multiple interdependencies exist between simultaneous utterances necessary to take into account for a successful machine interpretation. In this course, students will learn about the necessary steps involved in processing unimodal as well as multimodal input. The course will highlight typical stages in multimodal processing. Using speech processing as a primary example, they learn about: 1. A/D conversion 2. Segmentation 3. Syntactical analysis 4. Semantic analysis 5. Pragmatic analysis 6. Discourse analysis A specific emphasize will be on stages like morphology and semantic analysis. Typical aspects of multimodal interdependencies, i.e., temporal and semantic interrelations are highlighted and consequences for an algorithmic processing are derived. Prominent multimodal integration (aka multimodal fusion) approaches are described, in-						
Intende	ed lear	ning outcomes				
After th standir dent wi	e cours ng of al ill learn	se, the students will be a l the necessary steps inve about available tools fo	ble to build their owr olved and will know p r reoccurring tasks ar	n multimodal interfac prominent algorithmi nd their pros and con	es. They will have a broad under- ic solutions for each of them. Stu- is.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
V (2) +	Ü (2)					
Method module is	d of ass creditab	sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	t every semester, information on whether	
presen Langua credita	tation o ge of a ble for	of project results (approx ssessment: German and, bonus	. 40 minutes) ⁄or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Focuse HCI,GE	s availa	able for students of the N	laster's programme l	nformatik (Computer	Science, 120 ECTS credits):	
Worklo	ad					
150 h						

Teaching cycle

Referred to in LPO I (examination regulations for teaching-degree programmes)

Nodule annears in
Master's degree (1 major) Computer Science (2016)
Master's degree (1 major) Mathematics (2016)
Master's degree (1 major) Computational Mathematics (2016)
Master's degree (1 major) Computer Science (2017)
Master's degree (1 major) Computer Science (2018)
Master's degree (1 major) Computational Mathematics (2019)
Master's degree (1 major) Mathematics (2019)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)
Master's degree (1 major) Aerospace Computer Science (2020)
Master's degree (1 major) Computer Science (2021)
Master's degree (1 major) Aerospace Computer Science (2021)
Master's degree (1 major) Computational Mathematics (2022)
Master's degree (1 major) Mathematics (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Aerospace Computer Science (2023)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Mathematics (2024)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Master's degree (1 major) Computer Science (2025)

In the set of t	ES-231-m01				
Module coordinationModule offered byDean of Studies Informatik (Computer Science)Institute of Computer Science)ECTSMethod f gradingOnly after succ. compl. of module(s)5numerical gradeDurationModule levelOther prerequisites1 semestergraduateContentsKodels of embedded systems, implementation methods (ASIC, AISIP, micro controller succentroller succ	ence				
Dean of Studies Informatik (Computer Science) Institute of Computer Science ECTS Method of grading Only after succ. compl. of module(s) 5 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Models of embedded systems, implementation methods (ASIC, AISIP, micro controller systems, implementation planning static periodic and dynamic binding problems, binding problems	ience				
ECTS Meth→ of grading Only after succ. compl. of module(s) 5 num=rical grade Duration Module level Other prerequisites 1 semester graduate Contents Models of embedded systems, implementation methods (ASIC, AISIP, micro controller systems, implementation planning static periodic and dynamic binding problems become static.					
5 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Models of embedded systems, implementation methods (ASIC, AISIP, micro controller systems, implementation methods (ASIC, AISIP, micro controller systems, implementation planning static periodic and dynamic binding problems become systems.					
Duration Module level Other prerequisites 1 semester graduate Contents Models of embedded systems, implementation methods (ASIC, AISIP, micro controller systems, implementation planning static, periodic and dynamic, binding problems, bertown and dynamic, bertown and dynand dynamic, bertown and dy					
1 semester graduate Contents Models of embedded systems, implementation methods (ASIC, AISIP, micro controller systems, implementation planning static, periodic and dynamic, binding problems, be					
Contents Models of embedded systems, implementation methods (ASIC, AISIP, micro controller					
Models of embedded systems, implementation methods (ASIC, AISIP, micro controller					
re synthesis.	er), verification of embedded ardware synthesis, softwa-				
Intended learning outcomes					
The students are familiar with the technical possibilities for the design of embedded s most important techniques for the modelling, verification and optimisation of such systemates.	systems and master the /stems in hardware and				
Courses (type, number of weekly contact hours, language — if other than German)					
V (2) + Ü (2) Module taught in: German and/or English					
Method of assessment (type, scope, language — if other than German, examination offered — if not every s module is creditable for bonus)	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 m examination of one candidate each (approx. 20 minutes) or an oral examination in gro prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus	nay be replaced by an oral oups of 2 candidates (ap-				
Allocation of places					
Additional information					
Focuses available for students of the Master's programme Informatik (Computer Scien AT,SE,ES,LR,GE	nce, 120 ECTS credits):				
Workload					
150 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
§ 22 Nr. 3 b)					
Module appears in					
Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)					

Module	title				Abbreviation
Virtual Prototyping of Embedded Systems				10-I=VPES-232-m01	
Module	coord	inator		Module offered by	
Dean of	Studie	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 semes	ster	graduate			
Conten	ts				
Today's companies have to deal with complex hardware architectures such as heterogeneous multi-core sy- stems. Therefore, new development tools and approaches such as virtual prototyping are needed for efficient and fast design on electronic system level. In our research, we use SystemC and gem5 based virtual platforms for a thorough design space exploration on software and hardware level. Introduction to virtual prototyping and virtual product development methodology for embedded systems System models and specification Hardware/Software co-development with virtual prototyping Modelling with cycle accurate SystemC Modelling on higher level of abstraction with Transaction Level Modeling (TLM) Modelling of embedded processors with gem5 Design space exploration for embedded systems with virtual prototypes Intended learning outcomes Understanding advantages of novel virtual product development Finding the right level of abstraction for a specific problem Develop a feeling for the tradeoff between accuracy and simulation speed					
Courses	5 (type, n	umber of weekly contact hours. I	anguage — if other than Ger	man)	
V (2) + ĺ	Ü (2)				
Module	taugh	t in: German and/or Engl	ish		
Method module is	l of ass	e ssment (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 creditable for bonus					
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Focuses	s availa	able for students of the N	laster's programme Ir	nformatik (Computer	Science, 120 ECTS credits): ES
Worklo	ad				
150 h					
Teachin	ig cycl	9			

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Computer Science (2023)

Module title				Abbreviation	
Introduction in AI 10-AI=IAI-242-mo1					10-Al=IAI-242-m01
Module	e coordi	nator		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	npl. of module(s)	
5	numer	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
Essenti ging fro	al conc om clas	epts and algorithms of a sical simple heuristic me	rtificial intelligence. thods to more compl	Theoretical or practic ex probabilistic mod	cal competences are taught, ran- lels of artificial intelligence.
Intende	ed learr	ning outcomes			
The stu tify and	dents ł apply	nave theoretical and prac appropriate methods to s	tical knowledge in th solve problems in the	e field of artificial in field of AI.	telligence. They are able to iden-
Courses	S (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (2) + Í Module	Ü (2) e taught	t in: German and/or Engli	ish		
Method module is	d of ass creditabl	essment (type, scope, languag 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 b ation o 5 minut ge of as ble for l	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/ bonus	o 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-
Allocati	ion of p	laces			
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teachir	ng cycle	9			
Teachir	ng cycle	e: every year, winter seme	ester		
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
§ 22	Vr. 3 b)				
Module	e appea	rs in			
Master' Master'	's degre 's degre	ee (1 major) Artificial Inte ee (1 major) Mathematica	lligence (2024) Il Data Science (2025)	

Module title				Abbreviation			
Control Principles of Modern Communication Systems					10-l=SKS-252-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. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Conten	ts						
• C • C • O • B • N • Ir	ontrol ontrol verlays roadba lobile a itroduc	mechanisms of computer mechanisms implemente and decentralized mech and access networks and wireless communicat tion of analytical perform	r networks and mode ed and deployed on th nanisms ion systems nance evaluation	rn communication synthemistics in the internet such as t	ystems he Internet of Things (IoT)		
Intende	ed leari	ning outcomes					
The stu dern co measur analytic Courses V (2) + I Method module is	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. 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 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, 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	la stanla nun la	formatile (C			
Focuses	s avalla IN	able for students of the M	laster's programme l	nformatik (Computer	Science, 120 ECTS credits): 11,		
Worklo	ad						
150 h							
Teachir	ng cvcl	e					
	5 950						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
			00-1 - P/03/0				
Module	appea	urs in					
Master'	Master's degree (1 major) Computer Science (2025)						

Module title Abbreviation							
Performance Evaluation of Distributed Systems10-I=LVS-232-m01							
Module coordinator M				Module offered by	Module offered by		
holder	of the (Chair of Computer Scie	nce III	Institute of Comput	er Science		
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts	0	I				
The per ample, Traffic t process continu evaluat	formar e.g., th theoret ses, me tous M tion of	nce evaluation of distril ne Internet of Things (lo ic models, fundamenta ethods for performance arkov chains, analysis computer systems and	outed systems is illustr T). The following topics Il concepts of theory of analysis of technical s of Markov and non-Mar networks: service qual	ated and practically s will be conveyed: probability, transfor ystems, queuing and kov systems, practic ity and other charact	performed on a cont mation techniques, d traffic theory, discr cal examples for perf ceristics.	emporary ex- stochastic ete-time and formance	
Intende	ed lear	ning outcomes					
The stu means	dents of the	possess the methodic l theory of probability ar	knowledge and the pra-	ctical skills necessar ics.	y to model technica	l systems by	
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)			
V (2) +	Ü (2)						
Methoo module is	d of ass creditab	Sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
if anno examin prox. 19 Langua	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						
Allocal		Diaces					
Additio	nal inf	ormation					
Focuse AT,IT,G	s availa E,IN	able for students of the	Master's programme l	nformatik (Computer	Science, 120 ECTS (credits):	
Worklo	ad						
150 h							
Teachiı	ng cycl	e					
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)			
§ 22	Nr. 3 b)						
Module	e appea	ars in					
Module	e studie	es (Master) Computer S	cience (2019)				
Master	's degr	ee (1 major) Computer	Science (2023)				
Master	's degr	ee (1 major) Aerospace	Computer Science (20	23)			
Master	's degr	ee (1 major) Computati	onal Mathematics (202	4)			
Master	's degr	ee (1 major) Mathemati	CS (2024)		and Dougris (END) (-	225)	
Sunnle	s teacl	ning degree Gymnasiur N course MINT Teacher	Education PLUS Flite	Network Bavaria (FN	лк ваvaria (ENB) (20 В) (2025)	025)	
Master's wi (2025)	ith 1 majo	r Aerospace Computer Science	JMU Würzburg • g cord Master (120 E	enerated 19-Apr-2025 • exam CCTS) Luft- und Raumfahrtinfo	. reg. data re- rmatik - 2025	page 68 / 100	





Module	e title		Abbreviation							
System	is Bend	hmarking		10-l=SB-252-m01						
Module	e coord	inator		Module offered by	by					
holder of the Chair of Computer Scienc			e ll	Institute of Computer Science						
ECTS Method of grading		Only after succ. compl. of module(s)								
5	nume	rical grade								
Duration		Module level	Other prerequisites							
1 semester		graduate								
Contents										
Benchmarking has become a major discipline in science and technology as a driver of product quality, efficiency, and sustainability. Reliable and fair benchmarks enable educated decisions and play an important role as evaluation tools during system design, development, and maintenance. In research, benchmarks play an integral part in the evaluation and validation of new approaches and methodologies. The course introduces the foundations of benchmarking as a discipline, covering the three fundamental elements of each benchmarking approach: metrics, workloads, and measurement methodology. More specifically the following topics are covered: benchmarking basics, metrics, statistical measurements, experimental design, workloads, measurement tools, operational analysis, basic queueing models, and benchmark standardization. Furthermore, the course covers selected application areas and case studies, such as benchmarking of energy efficiency, virtualization, storage, microservices, cloud elasticity, performance isolation, resource demand estimation, and software and system security. Intended learning outcomes Students are able to design and build fair and reliable benchmarks, metrics, and measurement tools. Students can evaluate the quality of existing benchmarking approaches and benchmark results. 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)										
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										
Additio	nal inf	ormation								
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, IT, ES, HCI, GE, IN										
Workload										
150 h										
Teaching cycle										
Teaching cycle: every year, summer semester										
Referred to in LPO I (examination regulations for teaching-degree programmes)										
§ 22 II Nr. 3 b)										
Module appears in										
Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Computer Science (2025)										

Module	e title		Abbreviation							
Discrete Event Simulation 10-I=ST-232-mo1										
Module coordinator				Module offered by						
holder of the Chair of Computer Scienc		nce III	I Institute of Computer Science							
ECTS Method of grading		Only after succ. con	Only after succ. compl. of module(s)							
5 numerical grade										
Duration Module level		Other prerequisites	Other prerequisites							
1 semester graduate										
Contents										
The simulation of communication systems is illustrated and practically performed on contemporary examples, e.g., popular Internet services or the Internet of Things (IoT). The following topics will be conveyed: Introduction to simulation techniques, discrete-event simulation and process-oriented simulation, generating random numbers and random variables, statistical analysis of simulation results, evaluation of measured data, designing and evaluating simulation experiments, special random processes, possibilities and limitations of mo- delling and simulation, advanced concepts and techniques, practical execution of simulation projects.										
Intended learning outcomes										
The students possess the methodic knowledge and the practical skills necessary for the stochastic simulation of (technical) systems, the evaluation of results and the correct assessment of the possibilities and limits of simulation methods.										
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- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus										
Allocat	ion of _l	olaces								
Additio	nal inf	ormation								
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): IT,KI,ES,GE,IN										
Workload										
150 h										
Teaching cycle										
Teaching cycle: every year, summer semester										
Referred to in LPO I (examination regulations for teaching-degree programmes)										
§ 22 II Nr. 3 b)										
Module appears in										
Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024) Master's degree (1 major) Computational Mathematics (2024)										
Master's w (2025)	ith 1 majo	r Aerospace Computer Science	JMU Würzburg • g cord Master (120 F	enerated 19-Apr-2025 • exam ECTS) Luft- und Raumfahrtinfo	. reg. data re- prmatik - 2025	page 71 / 100				

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Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Information Systems (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Computer Science (2025)
Module	e title		Abbreviation			
Statist	ical Ne	twork Analysis	10-I=SNA-232-m01			
Module	e coord	inator		Module offered by		
holder of the Chair of Computer Science XV			e XV	Institute of Comput	Institute of Computer Science	
ECTS	rs Method of grading Only after succ. con			npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Contents						
Networks matter! This holds for technical infrastructures like communication or transportation networks, for in- formation systems and social media in the World Wide Web, but also for various social, economic and biologi-						

formation systems and social media in the World Wide Web, but also for various social, economic and biological systems. What can we learn from data that capture the interaction topology of such complex systems? What is the role of individual nodes and how can we discover significant patterns in the structure of networks? How do these structures influence dynamical process like diffusion or the spreading of epidemics? Which are the most influential actors in a social network? And how can we analyze time series data on systems with dynamic network topologies?

Addressing those questions, the course combines a series of lectures -- which introduce fundamental concepts for the statistical modelling of complex networks -- with weekly exercises that show how we can apply them to practical network analysis tasks. Topics covered include foundations of graph theory, centrality and modulari-ty measures, aggregate statistical characteristics of large networks, random graphs and statistical ensembles of complex networks, generating function analysis of expected graph properties, scale-free networks, stochastic dynamics in networks, spectral analysis, as well as the modelling of time-varying networks. The course material consists of annotated slides for lectures as well as a accompanying git-Repository of jupyter notebooks, which implement and validate the theoretical concepts covered in the lectures. Students can test and deepen their knowledge through weekly exercise sheets. The successful completion of the course requires to pass a final written exam.

Intended learning outcomes

The course will equip participants with statistical network analysis techniques that are needed for the data-driven modelling of complex technical, social, and biological systems. Students will understand how we can quantitatively model the topology of networked systems and how we can detect and characterize topological patterns. Participants will learn how to use analytical methods to make statements about the expected properties of very large networks that are generated based on different stochastic models. They further gain an analytical understanding of how the structure of networks shapes dynamical processes, how statistical fluctuations in degree distributions influence the robustness of systems, and how emergent network features emerge from simple random processes.

Courses (type, number of weekly contact hours, language – if other than German)

V (2) + Ü (2)

Module taught in: English

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: English

creditable for bonus

Allocation of places

Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): IN

Master's with 1 major Aerospace Computer Science	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re-	page 73 / 100
(2025)	cord Master (120 ECTS) Luft- und Raumfahrtinformatik - 2025	

Workload				
150 h				
Teaching cycle				

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Information Systems (2019) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Management (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Information Systems (2024) Master's degree (1 major) Information Systems (2024) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Management (2025) Master's degree (1 major) Computer Science (2025) Master's degree (1 major) Mathematical Data Science (2025) Master's degree (1 major) Economathematics (2024)

Module title					Abbreviation	
Machin	e Leari	ning for Networks 1		10-I=MLN1-232-m01		
Module	Module coordinator			Module offered by		
holder	of the C	Chair of Computer Scienc	e XV	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	graduate				
Conten	ts					
Networks matter! This holds for technical infrastructures like communication or transportation networks, for in- formation systems and social media in the World Wide Web, but also for various social, economic and biologi- cal systems. What can we learn from data that capture the interaction topology of such complex systems? What is the role of individual nodes and how can we discover significant patterns in the structure of networks? How do these structures influence dynamical process like diffusion or the spreading of epidemics? Which are the most influential actors in a social network? And how can we analyze time series data on systems with dynamic net- work topologies? Addressing those questions, the course combines a series of lectures which introduce fundamental concepts for the statistical modelling of complex networks with weekly exercises that show how we can apply them to practical network analysis tasks. Topics covered include foundations of graph theory, centrality and modulari- ty measures, aggregate statistical characteristics of large networks, random graphs and statistical ensembles of complex networks, generating function analysis of expected graph properties, scale-free networks, stocha- stic dynamics in networks, spectral analysis, as well as the modelling of time-varying networks. The course ma- terial consists of annotated slides for lectures as well as a accompanying git-Repository of jupyter notebooks, which implement and validate the theoretical concepts covered in the lectures. Students can test and deepen their knowledge through weekly exercise sheets. The successful completion of the course requires to pass a final written exam.						
The course will equip participants with statistical network analysis techniques that are needed for the data-driven modelling of complex technical, social, and biological systems. Students will understand how we can quantitatively model the topology of networked systems and how we can detect and characterize topological patterns. Participants will learn how to use analytical methods to make statements about the expected properties of very large networks that are generated based on different stochastic models. They further gain an analytical understanding of how the structure of networks shapes dynamical processes, how statistical fluctuations in degree distributions influence the robustness of systems, and how emergent network features emerge from simple random processes.						
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + Module	u (2) e taugh	t in: English				
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: English						
credita	ble for	bonus				
Allocat	ion of p	olaces				

Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,IT,SE,KI,HCI,IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

 $\label{eq:result} \textbf{Referred to in LPO I} \hspace{0.1 cm} (\text{examination regulations for teaching-degree programmes})$

§ 22 || Nr. 3 b)

Module appears in

••
Master's degree (1 major) Information Systems (2019)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Artificial Intelligence & Extended Reality (2024)
Master's degree (1 major) Artificial Intelligence (2024)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Mathematics (2024)
Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Mathematical Data Science (2025)

Module title					Abbreviation
Comput	ter Visi	on			10-xtAl=CV-202-m01
Module coordinator				Module offered by	
holder	of the C	Chair of Computer Science	e IV	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	graduate			
Conten	ts				
The lect basics a taught. and the	ture pro as well Actual eir resp	ovides knowledge about as the most recent appro models and methods of ective applications in ima	current methods and baches to image repre machine learning as age processing are sh	algorithms in the fie esentation, image pr well as their technic nown.	eld of computer vision. Important rocessing and image analysis are al backgrounds are presented
Intende	ed learn	ning outcomes			
Studen to inde	ts have pender	fundamental knowledge htly identify and apply su	e of problems and tec itable methods for co	hniques in the field ncrete problems.	of computer vision and are able
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + I Module	Ü (2) taugh	t in: English			
Method	l of ass	s 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)			
Written If annou examin prox. 15 Langua credital	examination of ation of ation of ation of ation of ation of a minution of a second state of a sole for a sole for a sole for at a sole for a so	nation (approx. 60 to 120 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: English bonus	o minutes) inning of the course, prox. 20 minutes) or	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			
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Information Systems (2019) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Computer Science (2025)					
Master's degree (1 major) Computer Science (2025)					

Module title					Abbreviation		
Image	Image Processing and Computational Photography 10-I=IP-222-m01						
Modul	e coord	inator		Module offered by			
holder	of the (Chair of Computer Scien	ce IV	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	ester	graduate					
Conter	nts						
This course aims at offering a self-contained account of image processing and computational photography and its underlying concepts, including the recent use of deep learning. The topics that will be covered are: introduction to image processing and computational photography sampling and quantization light and color image acquisition deep learning generative methods image signal processing image restoration sensor and image quality assessment image compression applications Intended learning outcomes Students have fundamental knowledge of problems and techniques in the field of image processing and compu- tational photography and are able to independently identify and apply suitable methods for concrete problems. Overview of the most important concepts of image formation, perception and analysis, and Computatio-							
• F	Providir	ig a sound solid backgro	ound knowledge for th	e Computer Vision co	ourses	,	
V (2)	ເype, r (ວ)	iumber of weekly contact nours,	ianguage — If other than Ger	iiiall)			
Modul	e taugh	t in: English					
Metho module i	d of ass s creditab	Sessment (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, informatior	n 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: English creditable for bonus							
Allocation of places							
Additional information							
Workload							
150 h							
Teachi	Teaching cycle						
Teachi	ng cycle	e: every year, winter sem	nester				
Master's w (2025)	vith 1 majo	r Aerospace Computer Science	JMU Würzburg • g cord Master (120 E	enerated 19-Apr-2025 • exam CTS) Luft- und Raumfahrtinfo	. reg. data re- rmatik - 2025	page 78 / 100	

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Information Systems (2019) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024) Master's degree (1 major) Information Systems (2024) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Computer Science (2025) Master's degree (1 major) Mathematical Data Science (2025)

Module title					Abbreviation	
Practical Computer Vision					10-I=PCV-232-m01	
Module	coord	nator		Module offered by		
holder	of the C	hair of Computer Science	e IV	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
Comple	tion of	a practical task in Comp	uter Vision			
Intende	ed learr	ning outcomes				
The pra	ctical a	llows participants to wor	k on a problem in Co	mputer Vision in tea	ms.	
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
R (8) Module	taugh	t in: German and/or Engli	sh			
Method module is	l of ass creditab	essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) writte If annou examin prox. 15 Langua credital	 b) written examination (approx. 60 to 120 minutes) lf 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 					
Allocati	ion of p	laces				
Additio	nal info	ormation				
Focuses R;HCl	s availa	ble for students of the M	aster's programme lr	nformatik (Computer	Science, 120 ECTS credits): KI,L-	
Worklo	ad					
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master'	s degre	ee (1 major) Computer Sc	ience (2023)			
Master'	s degre	ee (1 major) Aerospace Co	omputer Science (202	23)		
Master's degree (1 major) Computer Science (2025)						

Module title					Abbreviation
Image F	Process	sing and Computational I	Photography Lab		10-I=PIP-232-m01
Module	coord	inator		Module offered by	
holder	of the O	Chair of Computer Science	e IV	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
Comple	tion of	a practical task in Image	Processing and Com	putational Photogra	iphy
Intende	ed learr	ning outcomes			
The pra teams.	ctical a	allows participants to wor	'k on a problem in Im	age Processing and	Computational Photography in
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
R (8) Module	taugh	t in: German and/or Engli	ish		
Method module is	l of ass	e essment (type, scope, languag	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
b) writte If annou examin prox. 15 Langua	en exai unced l ation o ; minut ge of a	mination (approx. 60 to 1 by the lecturer at the beg f one candidate each (ap es per candidate). ssessment: German and/	20 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-
Allocati	ion of r	blaces			
Additio	nal info	ormation			
Worklo	ad				
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master'	s degre	ee (1 major) Computer Sc	ience (2023)		
Master'	s degre	ee (1 major) Aerospace Co	omputer Science (202	23)	
Master's degree (1 major) Computer Science (2025)					

Module title					Abbreviation		
Selected Topics in Algorithms					10-I=AKA-232-m01		
Module	coord	inator		Module offered by			
holder	of the O	Chair of Computer Science	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 5000	stor	graduate					
Conton		Sidudic					
Collecto	15 						
Selecte		s in algorithmics.					
Intende	ed learn	ning outcomes					
The stu solution	dents ι ns of co	understand the basic app omplex problems in this a	proach of algorithmic area and apply them t	computer science. T to similar questions.	hey are able to understand the		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) +	Ü (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		
a) writte b) proje the top c) oral e d) oral Langua credita	en exar ect worl ic) or examin examin ge of a ble for	nination (approx. 60 to 1 k (report (approx. 20 pag ation of one candidate ea ation in groups of up to 3 ssessment: German and, bonus	20 minutes) or es) with presentation ach (approx. 20 minu 3 candidates (approx. /or English	i (30 to 45 minutes) a ites) or . 15 minutes per cano	and subsequent discussion on didate)		
Allocat	ion of r	olaces					
Additio	nal info	ormation					
Focuse: AT	s availa	able for students of the M	laster's programme lr	nformatik (Computer	Science, 120 ECTS credits):		
Worklo	ad						
150 h							
Teachir	ng cycl	e					
	0 . ,	-					
Referre	d to in	IPOI (examination regulations	for teaching-degree progra	mmec)			
§ 22	Vr. 3 b)			inites)			
Module studies (Master) Computer Science (2010)							
Master's degree (1 major) Computer Science (2023)							
Master	Master's degree (1 major) Aerospace Computer Science (2023)						
Master	Master's degree (1 major) Computational Mathematics (2024)						
Master	Master's degree (1 major) Mathematics (2024)						
Master	s teach	ning degree Gymnasium I	WINT Teacher Educati	ion PLUS, Elite Netwo	ork Bavaria (ENB) (2025)		
Supple	mentar	v course MINT Teacher Ed	ducation PLUS. Elite	Network Bavaria (ENI	B) (2025)		
Master	s degre	ee (1 major) Computer Sc	ience (2025)				

Module title					Abbreviation	
Selecte	d Topi	cs in Theory		10-I=AKT-232-m01		
Module	coord	inator		Module offered by		
holder	of the O	Chair of Computer Science	e l	Institute of Compute	er Science	
ECTS	Metho	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade		•		
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts	<u> </u>				
Selecte	d topic	s in theory.				
Intende	d lear	ning outcomes				
The stu solution	dents units of co	understand the basic app omplex problems in this a	proach of theoretical of area and apply them t	computer science. Th to similar questions.	ney are able to understand the	
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
V (2) + l	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	
 a) written examination (approx. 60 to 120 minutes) or b) project work (report (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) Language of assessment: German and/or English 						
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Focuses AT	s availa	able for students of the M	laster's programme Ir	nformatik (Computer	Science, 120 ECTS credits):	
Worklo	ad					
150 h						
Teachir	ng cycl	9				
	3 -)					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
§ 22 N	۱r. з b)					
Module	appea	in in				
Module studies (Master) Computer Science (2010)						
Master's degree (1 major) Computer Science (2023)						
Master'	s degre	ee (1 major) Aerospace Co	omputer Science (202	23)		
Master'	Master's degree (1 major) Computational Mathematics (2024)					
Master's degree (1 major) Mathematics (2024)						
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)						
Supple	mentar	y course MINT Teacher Eo	ducation PLUS, Elite N	Network Bavaria (ENI	B) (2025)	
Master'	s degre	ee (1 major) Computer Sc	ience (2025)			
Master'	s degre	ee (1 major) Mathematica	l Data Science (2025))		

Module title					Abbreviation	
Selected Topics in Software Engineering					10-I=AKSE-232-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Science	e II	Institute of Compute	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	graduate				
Content	ts					
Selecte	d topic	s in software engineering	g.			
Intende	d learr	ning outcomes				
The stu	dents p	oossess an advanced kno	owledge about select	ed aspects of softwa	are engineering.	
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
V (2) + ĺ	Ü (2)					
Method module is	l of ass creditab	s essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
 b) projection b) projection c) oral ection d) oral ection Language creditation 	ect worl ic) or examin examin ge of a ole for l	k (report (approx. 20 pag ation of one candidate ea ation in groups of up to g ssessment: German and/ bonus	es) with presentation ach (approx. 20 minu 3 candidates (approx ′or English	(30 to 45 minutes) a tes) or . 15 minutes per cano	and subsequent discussion on didate)	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Focuses	s availa	able for students of the M	laster's programme li	nformatik (Computer	Science, 120 ECTS credits): SE.	
Worklo	ad					
150 h						
Teachin	ıg cycl	9				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 22 II Nr. 3 b)						
Module appears in						
Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)						
Master 3 degree (1 major) computer science (2025)						

Module title					Abbreviation
Selected Topics in IT Security					10-I=AKITS-232-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 semes	ster	graduate			
Conten	ts				
Selecte	d topic	s in IT security.			
Intende	ed learr	ning outcomes			
The stu comple	dents p x probl	possess an advanced kno lems in this area and to t	owledge in the area o ransfer them to relate	f IT security. They are ed questions.	e able to understand solutions to
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + Í Module	Ü (2) e taugh	t in: English			
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
b) proje the topi c) oral e d) oral e Langua	ect worl ic) or examin examin ge of a	ation of one candidate ea ation of one candidate ea ation in groups of up to g ssessment: English	es) with presentation ach (approx. 20 minu 3 candidates (approx	(30 to 45 minutes) a tes) or . 15 minutes per cano	and subsequent discussion on didate)
Allocati	ion of r	places			
Additio	nal info	ormation			
Focuses KI, LR, H	s availa HCI, ES	able for students of the M , SEC	laster's programme li	nformatik (Computer	Science, 120 ECTS credits): SE,
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22 II Nr. 3 b)					
Module appears in					
Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)					

Module title A					Abbreviation		
Selected Topics in Internet Technologies					10-I=AKIT-232-m01		
Module	e coord	inator		Module offered by			
holder	ofthe	Chair of Computer Scier	nce III	Institute of Comput	er Science		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites	5			
1 seme	ster	graduate					
Conten	ts						
A selected and co works, works, channed MO), m plannin reversed ment (I ment m visualis ves, or Intendo The stu and win Course V (2) + Methoo module is a) writh	Selected topics in computer communication, for example design aspects of future internet structures: setup and control structures of the internet, multicast protocols, protocols for multimedia communication, optical networks, control mechanisms for redundant and real-time communication networks, p2p networks, ad-hoc networks, or new concepts and technologies in mobile communication: digital modulation, signal propagation, channel coding, modern transmission technologies (adaptive modulation and coding, hybrid ARQ, OFDM, MI-MO), mac layer, mobileIP, routing in ad-hoc networks, vertical handover, UMTS IP multimedia subsystem, or planning and management methods in telecommunication networks: planning methods (forward engineering, reverse engineering), network management paradigms (central and decentral), framework for network management (IETF traffic engineering, ITU-T TMN, OSI management), planning and management methods (IP management methods in telecommunication and evaluation of traffic and performance data, visualisation, result handling, simulation and analysis of networks), management tools, outlook and perspectives, or other current topics. Intended learning outcomes The students have a knowledge of advanced and current topics in the management and design of modern wired and wireless communication systems. 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)						
b) proje the top c) oral d) oral Langua credita	ect wor ic) or examin examir age of a ble for	nation of one candidate nation of one candidate nation in groups of up to issessment: German an bonus	each (approx. 20 minutes) of each (approx. 20 minutes) 3 candidates (approx d/or English	n (30 to 45 minutes) a utes) or 15 minutes per can	and subsequent diso didate)	cussion on	
Allocat	ion of	places					
Additio	onal inf	ormation					
Focuse	s avail	able for students of the	Master's programme I	nformatik (Computer	r Science, 120 ECTS o	credits): IT.	
Worklo	Workload						
150 h							
Teachi	Teaching cycle						
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)			
§ 22	Nr. 3 b)						
Module	e appea	ars in					
Module	e studie	es (Master) Computer S	cience (2019)				
Master's w (2025)	ith 1 majo	r Aerospace Computer Science	JMU Würzburg • g cord Master (120 B	enerated 19-Apr-2025 • exam ECTS) Luft- und Raumfahrtinfo	1. reg. data re- ormatik - 2025	page 86 / 100	

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)

Module title					Abbreviation
Selected Topics in Intelligent Systems					10-I=AKIS-232-m01
Module	coord	inator		Module offered by	
holder	of the (Chair of Computer Science	e VI	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	graduate			
Conten	ts				
Selecte	d topic	s in intelligent systems.			
Intende	d learı	ning outcomes			
The stu- lutions	dents ¡ to com	possess an advanced kno plex problems in this are	owledge in the area o a and to transfer the	f intelligent systems m to related question	. They are able to understand so- ns.
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (2) + Ü	Ü (2)				
Method module is	l of ass creditab	essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
the topi c) oral e d) oral e Languag credital	ic) or examin examin ge of a ole for	ation of one candidate ea ation in groups of up to g ssessment: German and/ bonus	ach (approx. 20 minu 3 candidates (approx ⁄or English	tes) or . 15 minutes per cano	didate)
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Focuses	s availa	able for students of the M	laster's programme li	nformatik (Computer	Science, 120 ECTS credits): KI
Worklo	ad				
150 h					
Teachin	ıg cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22 II Nr. 3 b)					
Module appears in					
Module	studie	es (Master) Computer Scie	ence (2019) ionco (2022)		
Master'	s degri	ee (1 major) Computer SC	omputer Science (202	23)	
Master'	s teach	ning degree Gymnasium I	MINT Teacher Educati	on PLUS, Elite Netwo	ork Bavaria (ENB) (2025)
Suppler Master'	mentar s degre	y course MINT Teacher Ec ee (1 major) Computer Sc	ducation PLUS, Elite I ience (2025)	Network Bavaria (ENI	B) (2025)

Module title					Abbreviation
Selecte	d Topi	cs in Embedded Systems			10-I=AKES-232-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	graduate			
Conten	ts				
Selecte	d topic	s in embedded systems.			
Intende	ed leari	ning outcomes			
The stull	dents ¡ to com	possess specialised know plex problems in this are	vledge in the area of a and to transfer the	embedded systems. m to related question	They are able to understand so- ns.
Course	5 (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + l	Ü (2)				
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
the topi c) oral e d) oral e Langua credital	ic) or examin examin ge of a ble for	ation of one candidate ea ation in groups of up to g ssessment: German and/ bonus	ach (approx. 20 minu 3 candidates (approx for English	ites) or . 15 minutes per cano	didate)
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Focuses	s availa	able for students of the M	laster's programme li	nformatik (Computer	Science, 120 ECTS credits): ES.
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 22 II Nr. 3 b)					
Module appears in					
Module	studie	es (Master) Computer Sci	ence (2019)		
Master'	s degr	ee (1 major) Computer Sc	ience (2023)		
Master'	s degre	ee (1 major) Aerospace Co	MINT Toochor Education	23) ion DILIS Elito Notwo	ork Rovaria (END) (2005)
Supplei	s leach mentar	v course MINT Teacher Fo	ducation PLUS. Elite	Network Bavaria (FNI	B) (2025)
Master'	s degr	ee (1 major) Computer Sc	ience (2025)		· · · · ·

Module title Abbr					Abbreviation	
Selected Topics in Aerospace Engineering 10-I=AKLR-232-mo1						
Module	e coord	inator		Module offered by		
holder	of the (Chair of Computer Scier	nce VII	Institute of Computer 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	graduate				
Conten	ts					
sterest stems, and doo tions, p cial are stems, ment, s traffic c	sensor cking, o ayload as of n space pace la	s in aerospace enginee s and actuators for orie design of space ships, ls, optical systems, RAI avigation, space enviro astronomy and planet r aw, aeroflight topics, av air traffic management	ening, for example: sate ntation control, pertur design of planetary bas DAR, earth monitoring, nment, environment s nissions, space medic vionics for airplanes, a	bation of orbits, inte ses, life support syst thermo managemen imulation, verificatio ine and biology, mat ir traffic control, area	, rocket science, pro rplanetary orbits, rer ems, special aspects t, structure of space m and test of space f erial science, quality I navigation, pilot in	puision sy- ndezvous s of opera- ships, spe- faring sy- v manage- terfaces, air
Intende	ed lear	ning outcomes				
The stu conside	dents er these	oossess an advanced k e foundations in their fi	nowledge about the re uture plans of air or spa	spective topic of the aceborne systems.	selected area and a	re able to
Course	S (type, r	umber of weekly contact hours	s, language — if other than Ge	rman)		
V (2) +	Ü (2)					
Methoc module is a) writte b) proje the top c) oral e d) oral o Langua	d of ass creditab en exal ect wor ic) or examin examin ge of a	Sessment (type, scope, lang le for bonus) mination (approx. 60 to k (report (approx. 20 pa ation of one candidate lation in groups of up to ssessment: German an	uage — if other than German, 120 minutes) or ages) with presentatior each (approx. 20 minu 3 candidates (approx d/or English	examination offered — if no n (30 to 45 minutes) a ntes) or . 15 minutes per can	and subsequent disc	on on whether
Allocat	ion of r	bonus				
Additio	nal inf	ormation				
Focuses	s availa	able for students of the	Master's programme l	nformatik (Computer	Science, 120 ECTS o	redits): LR.
Worklo	ad		· · · ·	· · · · · ·		
150 h						
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	immes)		
§ 22 II Nr. 3 b)						
Module	Module appears in					
Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)						
(2025)	ur i majo	Acrospace computer science	cord Master (120 E	ECTS) Luft- und Raumfahrtinfo	ormatik - 2025	page 90 / 100





Master's degree (1 major) Computer Science (2025)

Module title				Abbreviation		
Selecte	Selected Topics in HCI 10-I=AKHCI-232-mo1					
Module	coord	inator		Module offered by		
holder	of the C	Chair of Computer Science	e IX	Institute of Compute	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 semes	ster	graduate				
Conten	ts					
Selecte	d topic	s in HCI.				
Intende	ed learr	ning outcomes				
The stu solution	dents ι ns to co	understand the basic app omplex problems in this a	proach of human-com area and to transfer t	puter interaction. Th hem to related quest	ey are able to understand the ions.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + l	Ü/S (2)					
Method module is	l of ass creditab	essment (type, scope, langua) le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
the topi c) oral e d) oral e Langua credital	ic) or examin examin ge of a ble for	ation of one candidate ea ation in groups of up to g ssessment: German and/ bonus	ach (approx. 20 minu 3 candidates (approx ⁄or English	ites) or . 15 minutes per cano	didate)	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Focuses	s availa	able for students of the M	laster's programme l	nformatik (Computer	Science, 120 ECTS credits): HCI.	
Worklo	ad					
150 h						
Teachir	ng cycl	e				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
§ 22 II Nr. 3 b)						
Module appears in						
Module	studie	es (Master) Computer Scie	ence (2019)			
Master'	s degre	ee (1 major) Computer Sc	ience (2023)			
waster'	s degre	ee (1 major) Aerospace Co	omputer Science (20)	23) San Di Lico Elita Nat		
waster'	s teach	ning degree Gymnasium I	WINT Teacher Education	ion PLUS, Elite Netwo	ртк вavaria (ENB) (2025)	
Master'	s deor	y course minur reacher EC	ience (2025)	NELWOIK DAVAIIA (ENI	2025)	
master	5 4651					

Module title					Abbreviation
Selected Topics in Computer Science					10-I=AKII-232-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	graduate			
Conten	ts				
Selecte	d topic	s in computer science.			
Intende	ed learn	ning outcomes			
The stu them to	dents a relate	are able to understand th d questions.	e solutions to comple	ex problems in comp	outer science and to transfer
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) + 1	Ü/S (2)				
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
c) oral e d) oral e Langua credital	examin examin ge of a ble for	ation of one candidate ea ation in groups of up to g ssessment: German and/ bonus	ach (approx. 20 minu 3 candidates (approx. ⁄or English	tes) or . 15 minutes per cano	didate)
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Teachir	ng cycle	e: if announced			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
§ 22 N	vr. 3 b)				
Module appears in					
Module studies (Master) Computer Science (2019) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)					

Module title					Abbreviation	
Selected Topics in Data Science					10-I=AKDS-232-m01	
Module	coord	inator		Module offered by		
Dean of	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 semes	ster	graduate				
Conten	ts					
Selecte	d topic	s in data science				
Intende	d learr	ning outcomes				
Studen blems i	ts unde n this f	erstand the basic approa ield and transfer them to	ch of data science. Th related issues.	ney are able to under	rstand how to solve complex pro-	
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (2) + I Module	Ü (2) taugh	t in: German and/or Engli	ish			
Method module is a) writte b) proje the topi c) oral e d) oral e Langua credital Allocati Focuses Worklo	Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) a) written examination (approx. 60 to 120 minutes) or b) project work (report (approx. 20 pages) with presentation (30 to 45 minutes) and subsequent discussion on the topic) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): Kl					
worklo	aq					
Teachir		9				
	is cycl	5				
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)		
\$ 22 II N	S 22 Nr 2 b)					
Module	apnea	in in				
Master' Master' Supple Master'	Module appears in Master's degree (1 major) Computer Science (2023) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)					

Module title Abbreviation					
Selected Topics in Physics 1					10-LURI=AKP1-232-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. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Selecte	ed topic	s in physics			
Intende	ed lear	ning outcomes			
The stu probler	dents i ns in th	understand the basic app his area and to apply ther	proach of physics. The n to similar question	ey are able to unders s.	stand the solutions to complex
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	Ü (2)				
Module	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	t every semester, information on whether
a) writt b) proje the top c) oral d) oral Langua credita	en exa ect wor ic) or examin examir ge of a ble for	mination (approx. 60 to 1 k (report (approx. 20 pag ation of one candidate en ation in groups of up to <u>3</u> ssessment: German and, bonus	20 minutes) or es) with presentation ach (approx. 20 minu 3 candidates (approx ⁄or English	(30 to 45 minutes) a tes) or . 15 minutes per can	and subsequent discussion on didate)
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
Master's degree (1 major) Aerospace Computer Science (2023)					

Module title Abbreviation					Abbreviation	
Selected Topics in Physics 2 10-LURI=AKP2-232-					10-LURI=AKP2-232-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)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Selecte	d topic	s in physics				
Intende	ed learı	ning outcomes				
The stu probler	dents (ns in th	understand the basic app his area and to apply ther	proach of physics. The n to similar question	ey are able to unders s.	stand the solutions to complex	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)					
Module	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	
a) writte b) proje the top c) oral e d) oral Langua credita	en exar ect wor ic) or examin examin ge of a ble for	mination (approx. 60 to 1 k (report (approx. 20 pag ation of one candidate en ation in groups of up to 3 ssessment: German and, bonus	20 minutes) or es) with presentation ach (approx. 20 minu 3 candidates (approx /or English	(30 to 45 minutes) a tes) or . 15 minutes per can	and subsequent discussion on didate)	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
240 h	240 h					
Teaching cycle						
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master	Master's degree (1 major) Aerospace Computer Science (2023)					

Module title					Abbreviation
Selected Topics in Astronomy and Astrophysics					10-LURI=AKAA-232-m01
Module	e coord	inator		Module offered by	
Dean o	f Studie	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	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Selecte	ed topic	s in astronomy and astro	physics		
Intende	ed learn	ning outcomes			
The stu lutions	dents (to com	understand the basic app plex problems in this are	proach of astronomy a a and to apply them	and astrophysics. Th to similar questions	ey are able to understand the so-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (2) +	Ü (2)				
Module	e taugh	t in: German and/or Engl	ish		
Method 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
a) writt b) proje the top c) oral d) oral Langua credita	en exar ect wor ic) or examin examin ge of a ble for	nination (approx. 60 to 1 k (report (approx. 20 pag ation of one candidate e lation in groups of up to <u>3</u> ssessment: German and, bonus	20 minutes) or es) with presentation ach (approx. 20 minu 3 candidates (approx ⁄or English	i (30 to 45 minutes) a ites) or . 15 minutes per can	and subsequent discussion on didate)
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
Master	Master's degree (1 major) Aerospace Computer Science (2023)				





Master Project Modules

(30 ECTS credits)

Module	Module title Abbreviation					
Conclu	Concluding Colloquium Aerospace Computer Science 10-LURI-MA-MK-212-mo1					
Module	e coord	inator		Module offered by		
Dean o	f Studie	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	graduate				
Conten	ts					
Present	tation a	and defence of the result	s of the Master's thes	is in an open discus	sion.	
Intende	ed learı	ning outcomes				
The stu	dents a	are able to present the re	sults of their Master's	s theses and defend	them in a discussion.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
К (о)						
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	
final co Langua	lloquiu ge of a	ım (approx. 60 minutes) ssessment: German and	/or English			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	irs in				
Master	's degr	ee (1 major) Aerospace C	omputer Science (202	21)		
Master's degree (1 major) Aerospace Computer Science (2023)						

Module title					Abbreviation
Master's Thesis Aerospace Computer Science					10-LURI-MA-202-m01
Module coordinator				Module offered by	
Dean of Studies Informatik (Computer			Science)	ience) Institute of Computer Science	
ECTS	ECTS Method of grading		Only after succ. compl. of module(s)		
25	nume	rical grade			
Duration		Module level	Other prerequisites		
1 semester		graduate			
Contents					
Researching and writing on a complex problem in aerospace informatics within a given time frame and adhering to the principles of good scientific practice.					
Intended learning outcomes					
The students are able to research and write on a complex topic in aerospace informatics, adhering to the princip- les of good scientific practice.					
Courses (type, number of weekly contact hours, language — if other than German)					
No courses assigned to module					
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)					
Master's thesis (50 to 100 pages) Language of assessment: German and/or English					
Allocation of places					
Additional information					
Time to complete: 6 months					
Workload					
750 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Aerospace Computer Science (2020)					
Master's degree (1 major) Aerospace Computer Science (2021)					
Master's degree (1 major) Aerospace Computer Science (2023)					