

Exclosure to Subject Specific Regulations  
 from 25.07.2018  
 for Master-Programme  
 Information and Communication Systems  
 at TUHH dual study program  
 Programme Director: Prof. Riccardo  
 Scandariato  
 Total: 150 CP  
 Number of Specialisations to choose: 1

# Course Scheme Master Information and Communication Systems (IMPICS) dual study program

Consolidated Version  
 for Study Cohort: WiSe22/23  
 en\_head\_sda  
 and Approval of Chair from:  
 11.01.2023  
 Replaces Version from: 14.07.2022  
 In Force on: 01.10.2022  
 Out of Force on: 30.09.2025

Information regarding the lectures are available in the TUHH modul manuals as well as in the course catalogue.

		Module						Examination			Course Work		
Re-com. Term	Module Name (German / English)	Language	ModuleResponsability	Institute	C/EC (1)	CM/OM (2)	CP (4)	Grade	Examination Form(3)	Compulsory	Course Work Type	Bonus (%)	
<b>Core Qualification</b> Compulsory Courses: 72 LP Optional Courses: 0 LP													
1	Praxismodul 1 im dualen Master / Practical module 1 (dual study program, Master's degree)	DE	Dr. Haschke	0-SLS	C	CM	10	N	SA				
2	Informationstheorie und Codierung / Information Theory and Coding	EN	Prof. Bauch	E-8	C	CM	6	Y	KL				
2	Praxismodul 2 im dualen Master / Practical module 2 (dual study program, Master's degree)	DE	Dr. Haschke	0-SLS	C	CM	10	N	SA				
2	Technischer Ergänzungskurs für IMPICS (laut FSPO) / Technical Complementary Course for IMPICS (according to Subject Specific Regulations)		Prof. Timm-Giel	E-4	C	OM	12	according to Subject Specific Regulations					
3	Forschungsprojekt ICS / Research Project ICS	EN	Prof. Scandariato	SD-E	C	CM	12	Y	STA				
3	Praxismodul 3 im dualen Master / Practical module 3 (dual study program, Master's degree)	DE	Dr. Haschke	0-SLS	C	CM	10	N	SA				
1-3	Theorie-Praxis-Verzahnung im dualen Master / Linking theory and practice (dual study program, Master's degree)	DE	Dr. Haschke	0-SLS	C	CM	6	N	SA				
1-3	Betrieb & Management / Business & Management	DE / EN	Prof. Meyer	W-1	C	OM	6	Selection out of seperatly published Catalogue					
<b>Specialisation Communication Systems</b> Compulsory Courses: 6 LP Optional Courses: 18 LP Number of Focuses to choose: 2													
1	Digitale Nachrichtenübertragung / Digital Communications	DE / EN	Prof. Bauch	E-8	C	CM	6	Y	KL	Y	SA	0	
1	Hochfrequenztechnik / Microwave Engineering	DE / EN	Prof. Kölpin	E-3	EC	CM	6	Y	KL	Y	FFST	0	
1	Kommunikationsnetze / Communication Networks	EN	Prof. Timm-Giel	E-4	EC	CM	6	Y	RE				

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2	Simulation von Kommunikationsnetzen / Simulation of Communication Networks	EN	Prof. Timm-Giel	E-4	EC	CM	6	Y	MP			
2	Weiterführende Konzepte der drahtlosen Kommunikation / Advanced Concepts of Wireless Communications	EN	Dr. Grünheid	E-8	EC	CM	6	Y	KL			
3	Hauptseminare Informatik und Kommunikationstechnik / Advanced Seminars Computer Science and Communication Technology	DE / EN	Dozenten des SD E	SD-E	EC	CM	6	Y	RE			
3	Moderne Funksysteme / Modern Wireless Systems	EN	Dr. Grünheid	E-8	EC	CM	6	Y	MP	Y	FFST	0
<b>Focus Software</b> Compulsory Courses: 0 LP Optional Courses: 12 LP												
1	Softwareanalyse / Software Analysis	EN	Prof. Schupp	E-16	EC	CM	6	Y	FFA			
1	Softwareverifikation / Software Verification	EN	Prof. Schupp	E-16	EC	CM	6	Y	KL	Y	ÜA	15
2	Advanced Internet Computing / Advanced Internet Computing	EN	Prof. Schulte	E-19	EC	CM	6	Y	FFA	Y	FFST	20
2	Angewandte Kryptographie / Applied Cryptography	EN	Prof. Fröschle	E-15	EC	CM	6	Y	KL	N	ÜA	10
2	Entwicklung von sicherer Software / Secure Software Engineering	EN	Prof. Scandariato	E-22	EC	CM	6	Y	KL			
2	Maschinelles Lernen in der Elektro- und Informationstechnik / Machine Learning in Electrical Engineering and Information Technology	EN	Prof. Bauch	E-8	EC	CM	6	Y	MP			
2	Modellprüfung - Beweiser und Algorithmen / Model Checking - Proof Engines and Algorithms	DE / EN	Prof. Fey	E-13	EC	CM	6	Y	MP	Y	FFST	0
2	Software für Eingebettete Systeme / Software for Embedded Systems	DE / EN	Prof. Renner	E-24	EC	CM	6	Y	KL	N	TE	10
2	Softwaretesten / Software Testing	EN	Prof. Schupp	E-16	EC	CM	6	Y	FFA			
<b>Focus Signal Processing</b> Compulsory Courses: 0 LP Optional Courses: 12 LP												
1	Digitale Audiosignalverarbeitung / Digital Audio Signal Processing	EN	Prof. Zölzer	E-8	EC	CM	6	Y	KL			
1	Digitale Signalverarbeitung und Digitale Filter / Digital Signal Processing and Digital Filters	EN	Prof. Bauch	E-8	EC	CM	6	Y	KL			
2	Computer-Grafik / Computer Graphics	EN	Prof. Knopp	E-5	EC	CM	6	Y	KL			
2	Prozessbildgebung / Process Imaging	EN	Prof. Penn	V-10	EC	CM	6	Y	KL			
2	Satellitenkommunikation und Navigation / Satellite Communications and Navigation	EN	Prof. Bauch	E-8	EC	CM	6	Y	MP			
3	Bildverarbeitung / Image Processing	DE / EN	Prof. Knopp	E-5	EC	CM	6	Y	KL			

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**Specialisation Secure and Dependable IT Systems** Compulsory Courses: 6 LP Optional Courses: 18 LP Number of Focuses to choose: 2

1	Softwareverifikation / Software Verification	EN	Prof. Schupp	E-16	C	CM	6	Y	KL	Y	ÜA	15
1	Software-Sicherheit / Software Security	EN	Prof. Scandariato	E-22	EC	CM	6	Y	KL			
2	Data Science zur Cybersicherheit / Cybersecurity Data Science	EN	Prof. Scandariato	E-22	EC	CM	6	Y	KL			
2	Entwurf von Dependable Systems / Design of Dependable Systems	DE / EN	Prof. Fey	E-13	EC	CM	6	Y	MP	Y	FFST	0
2	Modellprüfung - Beweiser und Algorithmen / Model Checking - Proof Engines and Algorithms	DE / EN	Prof. Fey	E-13	EC	CM	6	Y	MP	Y	FFST	0
3	Hauptseminare Informatik und Kommunikationstechnik / Advanced Seminars Computer Science and Communication Technology	DE / EN	Dozenten des SD E	SD-E	EC	CM	6	Y	RE			

**Focus Networks** Compulsory Courses: 0 LP Optional Courses: 12 LP

1	Digitale Nachrichtenübertragung / Digital Communications	DE / EN	Prof. Bauch	E-8	EC	CM	6	Y	KL	Y	SA	0
1	Kommunikationsnetze / Communication Networks	EN	Prof. Timm-Giel	E-4	EC	CM	6	Y	RE			
2	Advanced Internet Computing / Advanced Internet Computing	EN	Prof. Schulte	E-19	EC	CM	6	Y	FFA	Y	FFST	20
2	Simulation von Kommunikationsnetzen / Simulation of Communication Networks	EN	Prof. Timm-Giel	E-4	EC	CM	6	Y	MP			
3	Traffic Engineering / Traffic Engineering	EN	Prof. Timm-Giel	E-4	EC	CM	6	Y	MP			

**Focus Software and Signal Processing** Compulsory Courses: 0 LP Optional Courses: 12 LP

1	Digitale Audiosignalverarbeitung / Digital Audio Signal Processing	EN	Prof. Zölzer	E-8	EC	CM	6	Y	KL			
1	Softwareanalyse / Software Analysis	EN	Prof. Schupp	E-16	EC	CM	6	Y	FFA			
2	Autonomous Cyber-Physical Systems / Autonomous Cyber-Physical Systems	EN	Prof. Renner	E-24	EC	CM	6	Y	KL	N	TE	10
2	Computer-Grafik / Computer Graphics	EN	Prof. Knopp	E-5	EC	CM	6	Y	KL			
2	Entwicklung von sicherer Software / Secure Software Engineering	EN	Prof. Scandariato	E-22	EC	CM	6	Y	KL			
2	GPU Architectures / GPU Architectures	EN	Prof. Lal	E-EXK5	EC	CM	6	Y	MP			
2	Satellitenkommunikation und Navigation / Satellite Communications and Navigation	EN	Prof. Bauch	E-8	EC	CM	6	Y	MP			
2	Softwaretesten / Software Testing	EN	Prof. Schupp	E-16	EC	CM	6	Y	FFA			
3	Bildverarbeitung / Image Processing	DE / EN	Prof. Knopp	E-5	EC	CM	6	Y	KL			

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3	Sicherheit von Cyber-physischen Systemen / Security of Cyber-Physical Systems	EN	Prof. Fröschle	E-15	EC	CM	6	Y	KL	N	ÜA	10
<b>Thesis</b> Compulsory Courses: 30 LP Optional Courses: 0 LP												
4	Masterarbeit im dualen Studium / Master thesis (dual study program)		Professoren der TUHH	0-TUHH	C	CM	30	Y	AB			

#### Explanation:

<sup>1</sup>C=Compulsory, EC=Elective Compulsory

<sup>2</sup>CM=Compulsory Defined Module, OM=Optional Defined Module

<sup>3</sup>KL=Written exam, SA=Written elaboration, FFA=Subject theoretical and practical work, FFST=Subject theoretical and practical work, MP=Oral exam, RE=Presentation, STA=Study work, ÜA=Exercises, AB=Thesis, SA It.

<sup>4</sup>CP=Written elaboration (accord. to Internship Regulations), TE=Attestation

<sup>4</sup>CP=Credit Points

<sup>5</sup>VL=Lecture, SE=Seminar, GÜ=Recitation Section (small), PBL=Project-/problem-based Learning, PR=Practical Course, PK=Projection Course, HÜ=Recitation Section (large)

<sup>6</sup>DE=German, EN=English, DE/EN=German and English

<sup>7</sup>SWS=Contact hours