

# Discipline-Specific Study and Examination Regulations for the Master's Program in Computer Science at the University of Potsdam<sup>1</sup>

Dated February 7, 2024

The Faculty Council of the Faculty of Digital Engineering at the University of Potsdam pursuant to §§ 19 para. 1, 22 para. 1-3, 31 in conjunction with § 72 para. 2 (1) of the Law Governing the Universities in Brandenburg (BbgHG) of 28 April 2014 (GVBl.I/14, [no. 18]), as last amended by the Law of 23 September 2020 (GVBl.I/20, [no. 26]) in conjunction with the regulation on the organization of examination regulations to ensure the equivalency of studies, examinations and degrees (HSPV) of 4 March 2015 (GVBl.II/15, [no. 12]), as last amended by the Regulation of 7 July 2020 (GVBl.II/20, [no. 58]), and the Ordinance regulating academic accreditation (Accreditation of Study Programs - StudAkkV) of 28 October 2019 (GVBl.II/19, [no. 90]) and with Art. 21 para. 2 no. 1 of the General Rules and Regulations of the University of Potsdam (GrundO) of 17 December 2009 (AmBek. UP no. 4/2010, p. 60) in the version of the seventh statute amending the General Rules and Regulations of the University of Potsdam of 14 December 2022 (AmBek. UP no. 8/2023, p. 318) and § 1 para. 2 of the revised version of the general Study and Examination Regulations for the non-teaching Bachelor's and Master's programs of the University of Potsdam of 30 January 2013 (BAMA-O) (AmBek. UP no. 3/2013, p. 35), as last amended on 18 October (AmBek. UP no. 16/2023, p. 674), on 7 February 2024, the following study and examination regulation have been enacted as statutes:<sup>2</sup>

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## § 1 Scope

(1) These regulations apply to the *Computer Science* Master's program of the Faculty of Digital Engineering at the University of Potsdam. As discipline-specific regulations, they supplement the revised version of the general Study and Examination Regulations for the non-teaching Master's program of the University of Potsdam (BAMA-O).

(2) In the event of a conflict between these regulation and the BAMA-O, the provisions of the BAMA-O shall take precedence.

## § 2 Degree

Upon acquiring the necessary credits and following presentation of the requirements for graduation, the University of Potsdam shall confer upon the candidate the degree of Master of Science (abbr. "M.Sc.") through the Faculty of Digital Engineering.

## § 3 Goal of the Study Program and Professional Relevance

(1) The consecutive master's program is science and research-oriented. It provides in-depth scientific fundamentals, expanded specialist knowledge and skills in the field of computer science, as well as advanced methodological, social and personnel skills.

(2) Graduates of the Master's program possess a wide range of skills and knowledge in theories, concepts, methods, techniques, and procedures for the design, planning, analysis and development (or continued development) and maintenance of complex informatic systems, applications, infrastructures, and solutions. They also have an in-depth specialist knowledge in their chosen tracks. Students gain competency to carry out academic work and maintain a professional manner in an English-speaking environment. They are able to express solutions and results to research questions and implementation work in English in a way that is comprehensive to experts as well as to the general public.

(3) The Master's program also provides students with the in-depth knowledge and skills necessary for scientific work, scientifically sound judgement, critical reflection of specialized knowledge and responsible conduct in the field. Further key skills are provided in the areas of method competency,

<sup>1</sup> This translation is for informational purposes only. In the event of inconsistency or discrepancy between the German and English versions of these regulations, the German-language version shall prevail.

<sup>2</sup> Approved by the President of the University of Potsdam on 21 March, 2024.

social ability, and self-competency. In particular, graduates acquire key skills that are required for the management and direction of complex IT projects. Thus, the Master's program provides students the know-how to present and understandably communicate results to decision-makers as well as to critically discuss new ideas. Graduates are able to assess ethical and legal issues when dealing with complex IT systems and data. They have the competency to work responsibly in teams and to plan, implement, evaluate and control solutions based on a division of labor.

(4) Upon graduation, students in the Master's program earn a further professional qualification. They are in a position to assume leadership and management roles, particularly where emphasis is placed on the design, construction, maintenance and operation of complex IT system, IT applications, IT infrastructures and IT solutions (e.g., as a software architect, software project lead, IT consultant, software developer, application developer, software quality officer, data scientist, IT entrepreneur, etc.). Graduates are further able to carry out independent research and development work, to set up companies with an IT focus, or to achieve a subsequent qualification by entering the Ph.D. program. They are thereby able to use the skills they have acquired during their studies to accompany and help shape the change processes necessary through digitalization in business, science and society.

#### § 4 Duration and Structure of the Study Program; Part-time Suitability

(1) The consecutive and research-oriented Master's program in *Computer Science* is offered at the University of Potsdam as a single-subject program with a standard period of study (full-time study) of 4 semesters and 120 credit points. It can be studied without a focus (Open Track) or with one of the following focus areas (Tracks): "Data and AI", "Algorithms and Foundations", "Digital Health", "Security Engineering" or "Systems."

(2) The Master's program in *Computer Science* is suitable for part-time study. Part-time study requires support from an academic adviser with the aim of creating an individual study plan. Proof that advising has taken place must be included with the application for part-time studies in accordance with § 3 of the regulations governing part-time studies at the University of Potsdam (part-time regulations). Otherwise, the provisions of the part-time regulations apply.

#### § 5 Academic Coordination

According to § 8 paragraph 5 BAMA-O, the tasks of the student office are assigned to the Student Affairs office of the Faculty of Digital Engineering.

#### § 6 Modules of the Master's Program

(1) The Master's degree program in *Computer Science* consists of the following components:

Identifier	Title	CP
<b>A. Compulsory Modules (24 CP)</b>		
HPI-CS-LAB	Computer Science Lab	12
HPI-CS-RE	Research Methods & Ethics	6
HPI-CS-CR	Critical Reading and Discussion	6
<b>B. Compulsory Elective Modules – Professional Skills (6 LP)</b>		
<i>One module is to be selected from the following:</i>		
HPI-PSK-DT	Design Thinking	6
HPI-PSK-EI	Entrepreneurship and Innovation	6
HPI-PSK-LC	Law and Compliance	6
HPI-PSK-ML	Management and Leadership	6
HPI-PSK-TC	Technology Communication and Transfer	6
<b>C. Focus Area of Studies (60 CP)</b>		
<b>I Track: Data and AI</b>		
<b>1. Compulsory Modules (12 CP)</b>		
HPI-CS-DA	Data Analytics	6
HPI-CS-DS	Data Systems	6
<b>2. Compulsory Electives – Track-Specific (18 CP)</b>		
<i>A total of three of the following modules must be completed, of which at least two are core modules.</i>		
a) Core		
HPI-CS-ADC	Advanced Data Systems - Core	6
HPI-CS-AIC	AI Applications - Core	6
HPI-CS-DIC	Data Integration - Core	6
HPI-CS-MLC	Machine Learning - Core	6
HPI-CS-PMC	Probabilistic Machine Learning - Core	6
b) Deep Dive		
HPI-CS-ADD	Advanced Data Systems - Deep Dive	6
HPI-CS-AID	AI Applications - Deep Dive	6
HPI-CS-DID	Data Integration - Deep Dive	6
HPI-CS-MLD	Machine Learning - Deep Dive	6
HPI-CS-PMD	Probabilistic Machine Learning - Deep Dive	6

c) Specialization		
HPI-CS-ADS	Advanced Data Systems - Specialization	6
HPI-CS-AIS	AI Applications - Specialization	6
HPI-CS-DIS	Data Integration - Specialization	6
HPI-CS-MLS	Machine Learning - Specialization	6
HPI-CS-PMS	Probabilistic Machine Learning - Specialization	6
<b>3. Compulsory Electives – Cross-Track (30 CP)</b> <i>A total of five cross-track compulsory elective modules in accordance with paragraph 2 must be completed.</i>		
<b>II Track: Algorithms and Foundations</b>		
<b>1. Compulsory Modules (12 CP)</b>		
HPI-CS-ALG	Algorithmics	6
HPI-CS-STO	Stochastics	6
<b>2. Compulsory Electives – Track-Specific (24 CP)</b> <i>A total of four of the following modules must be completed, of which at least two are core modules.</i>		
a) Core		
HPI-CS-AAC	Applied Algorithms - Core	6
HPI-CS-ATC	Algorithm Theory - Core	6
HPI-CS-MMC	Mathematical Modelling - Core	6
HPI-CS-PSC	Provable Security - Core	6
b) Deep Dive		
HPI-CS-AAD	Applied Algorithms - Deep Dive	6
HPI-CS-ATD	Algorithm Theory - Deep Dive	6
HPI-CS-MMD	Mathematical Modelling - Deep Dive	6
HPI-CS-PSD	Provable Security - Deep Dive	6
c) Specialization		
HPI-CS-AAS	Applied Algorithms - Specialization	6
HPI-CS-ATS	Algorithm Theory - Specialization	6
HPI-CS-MMS	Mathematical Modelling - Specialization	6
HPI-CS-PSS	Provable Security - Specialization	6
<b>3. Compulsory Electives – Cross-Track (24 CP)</b> <i>A total of four cross-track compulsory elective modules in accordance with paragraph 2 must be completed.</i>		
<b>III Track: Systems</b>		
<b>1. Compulsory Modules (12 LP)</b>		
HPI-CS-LSA	Large-Scale Systems Architectures	6
HPI-CS-SDO	Systems Development and Operations	6

<b>2. Compulsory Electives – Track-Specific (36 CP)</b> <i>A total of six of the following modules must be completed, of which at least three are core modules.</i>		
a) Core		
HPI-CS-DAC	Data Systems - Core	6
HPI-CS-DSC	Dependable Systems - Core	6
HPI-CS-IGC	HCI and Graphics - Core	6
HPI-CS-ISC	Intelligent Systems - Core	6
HPI-CS-SDC	Systems Development Techniques and Tools - Core	6
HPI-CS-SIC	Systems Infrastructure - Core	6
b) Deep Dive		
HPI-CS-DAD	Data Systems - Deep Dive	6
HPI-CS-DSD	Dependable Systems - Deep Dive	6
HPI-CS-IGD	HCI and Graphics - Deep Dive	6
HPI-CS-ISD	Intelligent Systems - Deep Dive	6
HPI-CS-SDD	Systems Development Techniques and Tools - Deep Dive	6
HPI-CS-SID	Systems Infrastructure - Deep Dive	6
c) Specialization		
HPI-CS-DAS	Data Systems - Specialization	6
HPI-CS-DSS	Dependable Systems - Specialization	6
HPI-CS-IGS	HCI and Graphics - Specialization	6
HPI-CS-ISS	Intelligent Systems - Specialization	6
HPI-CS-SDS	Systems Development Techniques and Tools - Specialization	6
HPI-CS-SIS	Systems Infrastructure - Specialization	6
<b>3. Compulsory Electives – Cross-Track (12 CP)</b> <i>A total of two cross-track compulsory elective modules in accordance with paragraph 2 must be completed.</i>		
<b>IV Track: Digital Health</b>		
<b>1. Compulsory Modules (24 CP)</b>		
HPI-CS-DM	Data Management and Data Science	6
HPI-DHBMHS	Fundamentals of Healthcare Systems	6
HPI-CS-ML	Machine Learning	6
HPI-DHBMPPM	Introduction to Principles in Medicine	6

<b>2. Compulsory Electives – Track-Specific (18 CP)</b> <i>A total of three of the following modules must be completed, of which at least two are core modules.</i>		
a) Core		
HPI-CS-AMC	Advanced Machine Learning - Core	6
HPI-CS-ASC	Algorithms and Security - Core	6
HPI-CS-DEC	Application Development and Software Engineering - Core	6
b) Deep Dive		
HPI-CS-AMD	Advanced Machine Learning - Deep Dive	6
HPI-CS-ASD	Algorithms and Security - Deep Dive	6
HPI-CS-DED	Application Development and Software Engineering - Deep Dive	6
c) Specialization		
HPI-CS-AMS	Advanced Machine Learning - Specialization	6
HPI-CS-ASS	Algorithms and Security - Specialization	6
HPI-CS-DES	Application Development and Software Engineering - Specialization	6
<b>3. Compulsory Electives – Cross-Track (18 CP)</b> <i>A total of three cross-track compulsory elective modules in accordance with paragraph 2 must be completed.</i>		
<b>V Track: Security Engineering</b>		
<b>1. Compulsory Modules (12 CP)</b>		
HPI-CS-C	Cryptography	6
HPI-CS-S	Network Security	6
<b>2. Compulsory Electives – Track-Specific (24 CP)</b> <i>A total of four of the following modules must be completed, of which at least two are core modules.</i>		
a) Core		
HPI-CS-CAC	Cyber Attack and Defense - Core	6
HPI-CS-CPC	Advanced Cryptography and Protocols - Core	6
HPI-CS-DAC	Data Systems - Core	6
HPI-CS-DSC	Dependable Systems - Core	6
HPI-CS-SDC	Systems Development Techniques and Tools - Core	6
HPI-CS-SIC	Systems Infrastructure - Core	6
HPI-CS-SSC	Systems Security - Core	6
b) Deep Dive		
HPI-CS-CAD	Cyber Attack and Defense - Deep Dive	6
HPI-CS-CPD	Advanced Cryptography and Protocols - Deep Dive	6
HPI-CS-DAD	Data Systems - Deep Dive	6

HPI-CS-DSD	Dependable Systems - Deep Dive	6
HPI-CS-SDD	Systems Development Techniques and Tools - Deep Dive	6
HPI-CS-SID	Systems Infrastructure - Deep Dive	6
HPI-CS-SSD	Systems Security - Deep Dive	6
c) Specialization		
HPI-CS-CAS	Cyber Attack and Defense - Specialization	6
HPI-CS-CPS	Advanced Cryptography and Protocols - Specialization	6
HPI-CS-SSS	Systems Security - Specialization	6
<b>3. Compulsory Electives – Cross-Track (24 CP)</b> <i>A total of four cross-track compulsory elective modules in accordance with paragraph 2 must be completed.</i>		
<b>VI Track: Open Track</b>		
<b>1. Compulsory Electives – Track-Specific (36 CP)</b> Students, who study without having a focus area (Open Track), select six modules of 6 CPs each (a total of 36 CPs) from one or two of the previous tracks as follows: - two modules (12 CP) from the respective compulsory areas with the exception of the modules HPI-DHBMHS and HPI-DHBMPPM - two modules (12 CP) “Core” or “Deep Dive” or “Specialization” - two modules (12 CP) “Deep Dive” or “Specialization”		
<b>2. Compulsory Electives – Cross-Track (24 CP)</b> <i>A total of four cross-track compulsory elective modules in accordance with paragraph 2 must be completed.</i>		
<b>Total CP</b>		<b>90</b>
<b>Master's Thesis</b>		<b>30</b>

(2) The following modules are assigned to the cross-track compulsory elective area:

- the track-specific compulsory elective modules, that have not previously been selected in the respective track-specific compulsory area,
- all modules of the other tracks, with the exception of the modules HPI-DHBMHS: Fundamentals of Healthcare Systems (6) and HPI-DHBMPPM: Introduction to Principles in Medicine (6),
- the module HPI-CS-IRP: Individual Research Project (6),
- modules of the Professional Skills according to paragraph 1 letter B.), that have not previously been selected as compulsory elective modules, and the following modules:

HPI-PSK-DS	Design Thinking - Specialization	6
<b>or</b>		
HPI-PSK-ES	Entrepreneurship - Specialization	6

From those two modules, a maximum of one may be selected in the cross-track compulsory elective area.

(3) English is the language of instruction in the Master's program in *Computer Science*.

(4) Further details to the modules named in paragraph 1 are provided in Appendix 1: Module Catalog to these statutes.

(5) Examples of pertinent study plans are listed in Appendix 2 of these regulations.

### § 7 Master's Thesis

(1) After acquiring 72 credit points, entitlement is earned to the immediate assignment of a topic for the Master's thesis.

(2) The Master's thesis, including the defense (*Disputation*), is worth 30 credit points.

(3) Upon determination of the Master's thesis topic, the supervisor is obliged to assign the topic to one of the tracks. In this matter, the candidate is entitled to the right of proposal.

### § 8 Track Selection

(1) A track is considered to be selected once it has been completed.

(2) To complete the tracks "Data and AI," "Algorithms and Foundations," "Systems," "Digital Health" or "Security Engineering" the following requirements must be met:

- a) Completion of the corresponding module group from § 6 paragraph 1,
- b) Completion of the HPI-CS-CR and HPI-CS-LAB modules with a course that is assigned to the respective track in terms of content. The subject classification is made by the lecturers.
- c) Master's thesis in accordance with § 7 paragraph 3.

(3) For the selection "Open Track," the same requirements must be met, however the subject classification, in accordance with paragraph 2 letters b) and c), is not required.

### § 9 Free Examination Attempts (*Freiversuche*)

In the Master's program in *Computer Science*, two free examination attempts may be made, with the exception of the "Computer Science Lab" module.

### § 10 Entry into Effect

(1) These regulations shall take effect on the day following their publication in the Official Announcements of the University of Potsdam.

(2) After their entry into effect, these regulations apply to all students who are enrolled in the Master's program *Computer Science* at the University of Potsdam.

## Appendix 1: Module Catalog

The description in § 6 paragraph 1, as well as those modules of the study program listed in the following tables, regulate the statutes for the module catalog of the Digital Engineering Faculty for Bachelor's and Master's degree programs at the University of Potsdam (MK DEF). Supplementary regulations or deviations from the regulation of the MK DEF are specified in the following tables.

Module Nr.	Module Title	CP	CM/ CEM	Entry Requirements
HPI-CS-CR	Critical Reading and Discussion	6	CM	see MK DEF
HPI-CS-LAB	Computer Science Lab	12	CM	see MK DEF
HPI-CS-RE	Research Methods & Ethics	6	CM	see MK DEF
HPI-PSK-ML	Management and Leadership	6	CEM	see MK DEF
HPI-PSK-TC	Technology Communication and Transfer	6	CEM	see MK DEF
HPI-PSK-DT	Design Thinking	6	CEM	see MK DEF
HPI-PSK-DS	Design Thinking - Specialization	6	CEM	see MK DEF
HPI-PSK-EI	Entrepreneurship und Innovation	6	CEM	see MK DEF
HPI-PSK-ES	Entrepreneurship - Specialization	6	CEM	see MK DEF
HPI-PSK-LC	Law and Compliance	6	CEM	see MK DEF
HPI-CS-IRP	Individual Research Project	6	CEM	see MK DEF
HPI-CS-ALG	Algorithmics	6	CM/CEM*	see MK DEF
HPI-CS-STO	Stochastics	6	CM/CEM*	see MK DEF
HPI-CS-AAC	Applied Algorithms - Core	6	CEM	see MK DEF
HPI-CS-AAD	Applied Algorithms - Deep Dive	6	CEM	see MK DEF
HPI-CS-AAS	Applied Algorithms - Specialization	6	CEM	see MK DEF
HPI-CS-ATC	Algorithm Theory - Core	6	CEM	see MK DEF
HPI-CS-ATD	Algorithm Theory - Deep Dive	6	CEM	see MK DEF
HPI-CS-ATS	Algorithm Theory - Specialization	6	CEM	see MK DEF
HPI-CS-PSC	Provable Security - Core	6	CEM	see MK DEF
HPI-CS-PSD	Provable Security - Deep Dive	6	CEM	see MK DEF
HPI-CS-PSS	Provable Security - Specialization	6	CEM	see MK DEF
HPI-CS-MMC	Mathematical Modelling - Core	6	CEM	see MK DEF
HPI-CS-MMD	Mathematical Modelling - Deep Dive	6	CEM	see MK DEF
HPI-CS-MMS	Mathematical Modelling - Specialization	6	CEM	see MK DEF
HPI-CS-DA	Data Analytics	6	CM/CEM*	see MK DEF
HPI-CS-DS	Data Systems	6	CM/CEM*	see MK DEF
HPI-CS-ADC	Advanced Data Systems - Core	6	CEM	see MK DEF
HPI-CS-ADD	Advanced Data Systems - Deep Dive	6	CEM	see MK DEF
HPI-CS-ADS	Advanced Data Systems - Specialization	6	CEM	see MK DEF
HPI-CS-AIC	AI Applications - Core	6	CEM	see MK DEF
HPI-CS-AID	AI Applications - Deep Dive	6	CEM	see MK DEF
HPI-CS-AIS	AI Applications - Specialization	6	CEM	see MK DEF
HPI-CS-DIC	Data Integration - Core	6	CEM	see MK DEF
HPI-CS-DID	Data Integration - Deep Dive	6	CEM	see MK DEF
HPI-CS-DIS	Data Integration - Specialization	6	CEM	see MK DEF
HPI-CS-MLC	Machine Learning - Core	6	CEM	see MK DEF
HPI-CS-MLD	Machine Learning - Deep Dive	6	CEM	see MK DEF
HPI-CS-MLS	Machine Learning - Specialization	6	CEM	see MK DEF
HPI-CS-PMC	Probabilistic Machine Learning - Core	6	CEM	see MK DEF
HPI-CS-PMD	Probabilistic Machine Learning - Deep Dive	6	CEM	see MK DEF
HPI-CS-PMS	Probabilistic Machine Learning - Specialization	6	CEM	see MK DEF
HPI-CS-DM	Data Management and Data Science	6	CM/CEM*	see MK DEF
HPI-CS-ML	Machine Learning	6	CM/CEM*	see MK DEF
HPI-DHBMHS	Fundamentals of Healthcare Systems	6	CM/CEM*	see MK DEF
HPI-DHBMPPM	Introduction to Principles in Medicine	6	CM/CEM*	see MK DEF
HPI-CS-AMC	Advanced Machine Learning - Core	6	CEM	see MK DEF
HPI-CS-AMD	Advanced Machine Learning - Deep Dive	6	CEM	see MK DEF
HPI-CS-AMS	Advanced Machine Learning - Specialization	6	CEM	see MK DEF
HPI-CS-ASC	Algorithms and Security - Core	6	CEM	see MK DEF

HPI-CS-ASD	Algorithms and Security - Deep Dive	6	CEM	see MK DEF
HPI-CS-ASS	Algorithms and Security - Specialization	6	CEM	see MK DEF
HPI-CS-DEC	Application Development and Software Engineering - Core	6	CEM	see MK DEF
HPI-CS-DED	Application Development and Software Engineering - Deep Dive	6	CEM	see MK DEF
HPI-CS-DES	Application Development and Software Engineering - Specialization	6	CEM	see MK DEF
HPI-CS-C	Cryptography	6	CM/CEM*	see MK DEF
HPI-CS-S	Network Security	6	CM/CEM*	see MK DEF
HPI-CS-CPC	Advanced Cryptography and Protocols - Core	6	CEM	see MK DEF
HPI-CS-CPD	Advanced Cryptography and Protocols - Deep Dive	6	CEM	see MK DEF
HPI-CS-CPS	Advanced Cryptography and Protocols - Specialization	6	CEM	see MK DEF
HPI-CS-SSC	Systems Security - Core	6	CEM	see MK DEF
HPI-CS-SSD	Systems Security - Deep Dive	6	CEM	see MK DEF
HPI-CS-SSS	Systems Security - Specialization	6	CEM	see MK DEF
HPI-CS-CAC	Cyber Attack and Defense - Core	6	CEM	see MK DEF
HPI-CS-CAD	Cyber Attack and Defense - Deep Dive	6	CEM	see MK DEF
HPI-CS-CAS	Cyber Attack and Defense - Specialization	6	CEM	see MK DEF
HPI-CS-LSA	Large-Scale Systems Architectures	6	CM/CEM*	see MK DEF
HPI-CS-SDO	Systems Development and Operations	6	CM/CEM*	see MK DEF
HPI-CS-DSC	Dependable Systems - Core	6	CEM	see MK DEF
HPI-CS-DSD	Dependable Systems - Deep Dive	6	CEM	see MK DEF
HPI-CS-DSS	Dependable Systems - Specialization	6	CEM	see MK DEF
HPI-CS-DAC	Data Systems - Core	6	CEM	see MK DEF
HPI-CS-DAD	Data Systems - Deep Dive	6	CEM	see MK DEF
HPI-CS-DAS	Data Systems - Specialization	6	CEM	see MK DEF
HPI-CS-IGC	HCI and Graphics - Core	6	CEM	see MK DEF
HPI-CS-IGD	HCI and Graphics - Deep Dive	6	CEM	see MK DEF
HPI-CS-IGS	HCI and Graphics - Specialization	6	CEM	see MK DEF
HPI-CS-ISC	Intelligent Systems - Core	6	CEM	see MK DEF
HPI-CS-ISD	Intelligent Systems - Deep Dive	6	CEM	see MK DEF
HPI-CS-ISS	Intelligent Systems - Specialization	6	CEM	see MK DEF
HPI-CS-SDC	Systems Development Techniques and Tools - Core	6	CEM	see MK DEF
HPI-CS-SDD	Systems Development Techniques and Tools - Deep Dive	6	CEM	see MK DEF
HPI-CS-SDS	Systems Development Techniques and Tools - Specialization	6	CEM	see MK DEF
HPI-CS-SIC	Systems Infrastructure - Core	6	CEM	see MK DEF
HPI-CS-SID	Systems Infrastructure - Deep Dive	6	CEM	see MK DEF
HPI-CS-SIS	Systems Infrastructure - Specialization	6	CEM	see MK DEF

CP = Number of credit points; CM = Compulsory module; CEM = Compulsory elective module; \*PM, after appropriate track selection according to § 6 (1)

**Appendix 2: Model Study Plans for the Master’s Program *Computer Science***

**2.1. Track “Data and AI” – Starting in Winter Semester**

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-DS Data Systems (6 CP)	HPI-CS-DA Data Analytics (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	
HPI-CS-RE Research Methods & Ethics (6 CP)	PSK* (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

**2.2. Track “Data and AI” – Starting in Summer Semester**

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-DA Data Analytics (6 CP)	HPI-CS-DS Data Systems (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	
PSK* (6 CP)	HPI-CS-RE Research Methods & Ethics (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	



### 2.3. Track “Algorithms and Foundations” – Starting in Winter Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-ALG Algorithmics (6 CP)	HPI-CS-STO Stochastics (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
HPI-CS-RE Research Methods & Ethics (6 CP)	PSK* (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.4. Track “Algorithms and Foundations” – Starting in Summer Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-STO Stochastics (6 CP)	HPI-CS-ALG Algorithmics (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
PSK* (6 CP)	HPI-CS-RE Research Methods & Ethics (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

## 2.5. Track “Systems” – Starting in Winter Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-LSA Large-Scale Systems Architectures (6 CP)	HPI-CS-SDO Systems Development and Operations (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Track Core/ Deep Dive/ Specialization (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	Track Core (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
HPI-CS-RE Research Methods & Ethics (6 CP)	PSK* (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

## 2.6. Track “Systems” – Starting in Summer Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-SDO Systems Development and Operations (6 CP)	HPI-CS-LSA Large-Scale Systems Architectures (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 LP)	Track Core (6 LP)		
Track Core/ Deep Dive/ Specialization (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	Track Core (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
PSK* (6 CP)	HPI-CS-RE Research Methods & Ethics (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.7. Track “Digital Health” – Starting in Winter Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-DHBMPPM Introduction to Principles in Medicine (6 CP)	HPI-CS-DM Data Management and Data Science (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
HPI-DHBMHS Fundamentals of Healthcare Systems (6 CP)	HPI-CS-ML Machine Learning (6 CP)		
Track Core (6 CP)	Track Core (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	
HPI-CS-RE Research Methods & Ethics (6 CP)	PSK* (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.8. Track “Digital Health” – Starting in Summer Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-DM Data Management and Data Science (6 CP)	HPI-DHBMPPM Introduction to Principles in Medicine (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
HPI-CS-ML Machine Learning (6 CP)	HPI-DHBMHS Fundamentals of Healthcare Systems (6 CP)		
Track Core (6 CP)	Track Core (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	
PSK* (6 CP)	HPI-CS-RE Research Methods & Ethics (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.9. Track “Security Engineering” – Starting in Winter Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-S Network Security (6 CP)	HPI-CS-C Cryptography (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
HPI-CS-RE Research Methods & Ethics (6 CP)	PSK* (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.10. Track “Security Engineering” – Starting in Summer Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
HPI-CS-C Cryptography (6 CP)	HPI-CS-S Network Security (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master’s Thesis (30 CP)
Track Core (6 CP)	Track Core (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
PSK* (6 CP)	HPI-CS-RE Research Methods & Ethics (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.11. Open Track – Starting in Winter Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
Compulsory Module (6 CP)	Compulsory Module (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master's Thesis (30 CP)
Track Core/ Deep Dive/ Specialization (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
HPI-CS-RE Research Methods & Ethics (6 CP)	PSK* (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

### 2.12. Open Track – Starting in Summer Semester

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
Compulsory Module (6 CP)	Compulsory Module (6 CP)	HPI-CS-LAB Computer Science Lab (12 CP)	Master's Thesis (30 CP)
Track Core/ Deep Dive/ Specialization (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)		
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
Compulsory Elective (6 CP)	Compulsory Elective (6 CP)	Track Core/ Deep Dive/ Specialization (6 CP)	
PSK* (6 CP)	HPI-CS-RE Research Methods & Ethics (6 CP)	HPI-CS-CR Critical Reading and Discussion (6 CP)	

\*“PSK” refers to the compulsory elective module from the “Professional Skills” area.