

- NON-OFFICIAL READ-ONLY VERSION -

Examination Regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology of the University of Siegen

Dating from April 9, 2013
last amended on September 22, 2020

These Regulations are based on the wording:

- of the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from April 9, 2013 (Official Notice 27/2013),
- of the regulations amending the examination regulations for the master's degree program in Computer Science at the University of Siegen dating from May 5, 2015 (Official Notice 65/2015),
- of the second regulations to amend the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from June 20, 2016 (Official Notice 54/2016),
- of the third regulations to amend the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from April 4, 2017 (Official Notice 29/2017),
- of the fourth regulations to amend the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from May 8, 2018 (Official Notice 24/2018),
- of the fifth regulations to amend the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from October 9, 2018 (Official Notice 50/2018),
- of the sixth regulations to amend the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from March 28, 2019 (Official Notice 10/2019).
- of the seventh regulations to amend the examination regulations for the master's degree program in Computer Science of the Faculty of Natural Sciences and Technology of the University of Siegen dating from September 22, 2020 (Official Notice 66/2020).

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Part 1

Structure of these Examination Regulations

Section 1^{*2}

Structure of these Examination Regulations

- (1) In the context of these Examination Regulations, all provisions of the “Unified Regulations for examinations in the degree programs of the Department of Electrical Engineering and Computer Science at the University of Siegen” dating from February 25, 2013 **as amended** (hereinafter “Unified Regulations”) apply. These define basic terms and establish general rules for the examination procedure.
- (2) These Examination Regulations consist of
 1. a part describing the degree program in general, in the process defining individual fields of study and supplementing the Unified Regulations with additional regulations if applicable (Part 2),
 2. the specification of the contents of individual fields of study (Part 3),
 3. final provisions (Part 4),
 4. module catalogs (Annex 1),
 5. degree plans (Annex 2).

Part 2

General description of the degree program

Section 2^{*2}

Goal and structure of the degree program

- (1) The consecutive master's degree program in Computer Science is research-oriented. It conveys the scientific basics and methods in the field of computer science. The degree program deals with key issues of computer science in more detail and teaches how to (further) develop methods and procedures for problem-solving in the field of computer science. Another goal is to teach key qualifications such as communication, teamwork, presentation and moderation skills. 45 CP of the degree program volume are allocated to modules in an area of special focus.
- (2) The master's degree program in Computer Science is an academic degree program. The specialist contents and the advanced courses to acquire key qualifications have the particular aim to enable the students to perform scientific work in research and development and assume performance roles in software and hardware development projects. The professional field for graduates of the master's degree program in Computer Science comprises all kinds of work focusing on the research of fundamental issues or the development, operation and maintenance of complex information processing systems. This includes the fields of software technology, information systems, databases, knowledge-based systems, communication and security as well as algorithms and programming.
- (3) The standard period of study is 4 semesters.
- (4) The Subcommittee on Computer Science of the central examining board of Faculty IV is responsible for this degree program.
- (5) **Courses can be offered in German or English.**

Section 3^{2.3}

Admission requirements

- (1) The admission requirements according to the Unified Regulations apply. In addition, prospective students who do not have completed their admission requirements at a German-language institution must provide proof of proficiency in German or English at the level of the DSH examination (proficiency in German) or a TOEFL iBT of at least 87 or an IELTS (Volume 5 – 6) test (proficiency in English) or a comparable test by means of an officially certified document. If no proof of proficiency in German can be provided, only courses in English can be taken. For admission to the master's degree program, proof of the required basic specialist knowledge required for taking the English-language courses in the compulsory elective block "Master's in Computer Science - Key Fields" must be provided. These courses are labeled accordingly in the module catalog "Master's in Computer Science - Key Fields".
- (2) The submission of a curriculum vitae can be requested to review the admission requirements.

Section 4

Academic degree awarded

The Department of Electrical Engineering and Computer Science will award the academic degree of "Master of Science", abbreviated "M.Sc.", to students who have passed the master's examination.

Section 5

Fields of study

- (1) A field of study is a group of course work requirements. All course work requirements of all fields of study must be completed.
- (2) The degree program is subdivided into the following fields of study:
 1. Field of study: Computer Science – Compulsory Parts
 2. Field of study: Computer Science – Advanced Study

Section 6^{2.3}

Forms of course work notation

The following paragraphs specify the course work to be performed in the respective fields of study in the form of lists. These lists specify:

1. the name of the course work requirement,
2. the type of the course work requirement,
3. the allocated credit points (CP).

The type of the course work requirement is specified using the following abbreviations:

1. W1/W1.5/W2/W3: one, two or three-hour compact written examination or accordingly distributed written examination (see Unified Regulations),
2. O: Oral examination,
3. EoP: Evidence of performance
4. I: Study internship,
5. PG: Project group,
6. S: Seminar
7. MT: Master's thesis with a completion period of 6 months,
8. FK: see information in the associated module catalog.

**Part 3 Fields of
study**

Section 7³

**Course work requirements in field of
study Computer Science – Compulsory**

Section

In this field of study, the students must take the following modules and perform course work with a total of 75 credit points:

1. Compulsory elective block Computer Science - Key Fields: A total course work volume of at least 20 credit points from the catalog "Master's in Computer Science - Key Fields" shall be chosen,
2. compulsory module Seminar [S, 5 CP, not graded],
3. compulsory module Project Group [PG, 20 CP],
4. compulsory module Master's Thesis (MT) [MT, 30 CP].

Section 8^{1,4}

**Course work requirements in field of
study Computer Science – Advanced**

Section

- (1) This field of study consists of a compulsory elective block with a total of 45 credit points.
- (2) The students can choose modules from the catalog "Master's in Computer Science - Advanced Study", from the catalog "Master's in Computer Science - Key Fields" as well as from other master's degree programs. Modules from the catalogue "Master's in Computer Science - Key Fields" may only be chosen if they have not already been chosen in the compulsory elective block "Computer Science - Key Fields". Modules from other master's degree programs can only be chosen if places are still available in the chosen module and participating in the course and the examination is possible.

The chosen module combination

- must be useful with regard to its content in the field of study "Computer Science – Compulsory Parts" and
 - must be suitable to achieve the qualification goals specified for the master's degree program in Computer Science according to Section 2 and
 - should be completed within the standard period of study.
- (3) The choice of modules requires the approval of the mentor according to Section 15 of the Unified Regulations.

**Part 4 Final
provisions**

Section 9²

Transitional arrangements

- (1) The preceding provisions apply to all students who have enrolled at the University of Siegen for the master's degree program in Computer Science for the first time in winter semester 2012/2013 or thereafter.
- (2) Students who have already enrolled at the University of Siegen for the master's degree program in Computer Science in summer semester 2012 or earlier generally continue to follow the degree program according to the examination regulations dating from March 16, 2007 (Official Notice 5/2007) as most recently amended. The degree program must be completed by winter semester 2016/2017. Thereafter, the examination regulations dating from April 9, 2013 (Official Notice 27/2013) as most recently

amended will apply without limitation. Any right to take examinations according to the examination regulations dating from March 16, 2007 as most recently amended no longer applies.

Section 10
Entry into effect

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This provision governs the entry into effect of the original examination regulations. This announcement contains the versions of the examination regulations in effect from October 1, 2014; October 1, 2016; October 1, 2017; May 10, 2018 and March 29, 2019.

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Annex 1: Module catalogs^{*1,2,3,4,5,6,7}

The form of examination is indicated using the aforementioned forms of course work notation.

Module catalog “Master’s in Computer Science - Key Fields”^{*1,2,3,7}

1. Database Systems II [O, 5 CP],
2. Software Technology II [O, 5 CP],
3. Computer Graphics II (E) [W2, 5 CP],
4. Embedded Systems (E) [O, 5 CP],
5. Computer Architectures II (E) [O, 5 CP],
6. Parallel Processing (E) [O, 5 CP],
7. Computer Networks II [O, 5 CP],
8. Logic II [O, 5 CP],
9. Algorithmics I (E) [O, 5 CP].

The modules labeled (E) will be offered in English as needed.

Module catalog “Master’s in Computer Science – Advanced Study”^{*1,2,3,4,5,6,7}

1. Algebra [EoP, 10 CP],
2. Algorithmics II [O, 5 CP],
3. Approximation and Online Algorithms [O, 9 CP],
4. Installation and Connection Technology [O, 5 CP],
5. Communications Engineering / ANT [W2, 5 CP],
6. Computer Graphics III [O, 5 CP],
7. Computer Graphics IV [O, 5 CP],
8. Computer Graphics Practical Training [I, 5 CP],
9. Convex Optimization for Computer Vision [O, 10 CP],
10. Deep Learning [O, 5 CP],
11. Development of the Embedded Systems with FPGAs [O, 5 CP]
12. Digital Transformation and Cyber Physical Systems [O, 6 CP],
13. Introduction to Numerical Methods and FEM [W2, 5 CP],
14. Electrical Machines and Drives [W1.5, 4 CP],
15. Embedded Control [W2, 5 CP],
16. Estimation Theory [O, 5 CP],
17. Advanced Semiconductor and Microelectrical Engineering II [O, 5 CP],
18. High-Tech-Medicine I [FK1, 5 CP],
19. Industrial Communication [O, 5 CP],
20. Communication and Information Security I [O, 5 CP],
21. Communication and Information Security II [O, 5 CP],
22. Knowledge Discovery from Text [O, 5 CP],
23. Laboratory Internship Ubiquitous Systems [I, 5 CP],
24. Machine Vision [O, 5 CP],
25. Machine Learning [O, 5 CP],

26. Mathematical Methods of Data Security	[EoP, 9 CP],
27. Micro System Engineering – Manufacturing	[O, 5 CP],
28. Micro System Engineering – Geometry	[O, 5 CP],
29. Micro System Engineering – Testing	[O, 5 CP],
30. Micro System Engineering – Behavior	[O, 5 CP],
31. Model Checking	[O, 10 CP],
32. Neuroscience in Medical Informatics	[O, 5 CP],
33. Numerical Methods for Visual Computing	[O, 5 CP],
34. Numerical Analysis I	[EoP, 10 CP],
35. Numeric Fundamentals of Simulation Technology	[O, 5 CP],
36. Internship Scientific Working	[I, 5 CP],
37. Process Automation	[O, 5 CP],
38. Recent Advances in Machine Learning	[Research paper, 5 CP],
39. Seminar	[S, 5 CP],
40. Storage Technologies	[O, 5 CP],
41. Statistics for Medical Informatics	[W2, 5 CP],
42. Statistical Learning Theory	[O, 5 CP],
43. Stochastic Models	[O, 5 CP],
44. Structural Complexity Theory	[O, 10 CP],
45. Synthetic Aperture Radar Imaging	[O, 5 CP],
46. Telematics – Multimedia	[O, 5 CP],
47. Telematics – Technology and Applications	[O, 5 CP],
48. Theoretical Computer Science	[S, 5 CP],
49. Ubiquitous Computing	[O, 5 CP],
50. Distributed Systems	[O, 5 CP],
51. In-depth Medicine	[W1.5, 10 CP],
52. Virtual Reality	[O, 5 CP],
53. Scientific Visualization	[O, 5 CP],
54. Knowledge-based Systems II	[W2, 5 CP],
55. Knowledge Management II	[W2, 5 CP],
56. Number Theory for Computer Scientists	[EoP, 10 CP].

1 combined examination weighted as follows: 60% seminar paper, 40% oral examination.

Annex 2: Degree plans^{*3,5}

Module	1st sem.		2nd sem.		3rd sem.		4th sem.		Total		
	HWS	CP	HWS	CP	HWS	CP	HWS	CP	HWS	CP	
4 core modules from Database Systems II Software Technology I Computer Graphics II Embedded Systems Computer Architectures II Parallel Processing Computer Networks II Logic II Algorithmics I		15		5							20
Advanced study		15		10		20					45
Seminar				5							5
Project group				10		10					20
Master's thesis								30			30
Total modules		30		30		30		30			120

*1 Section 8 and Annex 1 amended by Official Notice 65/2015 "Regulations to amend the examination regulations for the master's degree program in Computer Science at the University of Siegen" dating from May 5, 2015, entered into effect on October 1, 2014, adopted on October 8, 2014.

*2 Sections 1, 2, 3, 6, 9 and Annex 1 amended by Official Notice 54/2016 "Second regulations to amend the examination regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology" of the University of Siegen dating from June 20, 2016, entered into effect on the day after publication or on October 1, 2016, adopted on May 4, 2016.

*3 Sections 3, 6, 7 and Annexes 1, 2 amended by Official Notice 29/2017 "Third regulations to amend the examination regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology" of the University of Siegen dating from April 4, 2017, entered into effect on October 1, 2017, adopted on March 15, 2017.

*4 Section 8 and Annex 1 amended by Official Notice 24/2018 "Fourth regulations to amend the examination regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology" of the University of Siegen dating from May 8, 2018, entered into effect on May 10, 2018, adopted on March 7, 2018.

*5 Annexes 1, 2 amended by Official Notice 50/2018 "Fifth regulations to amend the examination regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology" of the University of Siegen dating from October 9, 2018, entered into effect on October 1, 2018, adopted on September 19, 2018.

*6 Annex 1 amended by Official Notice 10/2019 "Sixth regulations to amend the examination regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology" of the University of Siegen dating from March 28, 2019, entered into effect on March 29, 2019, adopted on March 6, 2019.

*7 Annex 1 amended by Official Notice 66/2020 "Seventh regulations to amend the examination regulations for the master's degree program in Computer Science at the Faculty of Natural Sciences and Technology" of the University of Siegen dating from September 22, 2020, entered into effect on September 26, 2020, adopted on September 2, 2020.