

**Study and Subject Examination Regulations
for the International Software Systems Science
Master's Degree Programme
at the University of Bamberg
of 29th September 2025**

Note: Unofficial English translation of the Studien- und Fachprüfungsordnung für den Masterstudiengang International Software Systems Science of 29th September 2025, effective from 1st October 2025. Only the German version is legally binding.

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In accordance with Article 9 Sentence 1 in conjunction with Article 80 Paragraph 1 Sentence 1 and Article 84 Paragraph 2 Sentence 1 of the Bavarian Higher Education Innovation Act (Bayerisches Hochschulinnovationsgesetz, BayHIG) of 5th August 2022 (GVBl. p. 414), the University of Bamberg issues the following

Study and Subject Examination Regulations

I. General regulations

§29

Scope of application

- (1) These study and subject examination regulations comprise regulations for the International Software Systems Science master's degree programme.
- (2) The International Software Systems Science master's degree programme is a consecutive, advanced master's degree programme that builds upon a bachelor's degree in computer science, software systems science or another closely related degree programme comprising at least 180 ECTS points.
- (3) These study and subject examination regulations supplement the general examination regulations for bachelor's and master's degree programmes of the Faculty of Information Systems and Applied Computer Sciences (APO WIAI) of the University of Bamberg.

§30

Programme duration and credit scope

- (1) ¹The standard programme duration is four semesters. ²The programme comprises at least 120 ECTS points.
- (2) The maximum permitted duration of study is six semesters.

§31

Related degree programmes

¹As defined by § 5 APO WIAI, degree programmes related to the International Software Systems Science master's degree programme are all degree programmes in the computer science subject field (in particular bioinformatics, computer and communications technology, computer science, computer engineering/technical computer science, media informatics, medical informatics, information systems). ²In individual cases, the examining board shall decide whether a degree programme is considered to be related.

§32 Module handbook

¹As a rule, the examining board shall adopt a module handbook for the coming academic year by the end of the summer semester and announce it within the university. ²The module handbook contains at least the descriptions of the modules of the WIAI Faculty in accordance with these study and subject examination regulations and regulates the details for these modules, in particular: contents and learning objectives, forms of teaching, applicability of modules, credit hours per week, workload, frequency and duration of a module; it also specifies the examination provisions of these regulations.

II. Final examination and module examination

§33 Programme admission requirements

- (1) Admission to the International Software Systems Science master's degree programme requires a university degree or an equivalent degree with a standard period of study of at least six semesters comprising 180 ECTS points and an overall mark of 2.7 or better in a degree programme in the same field of study.
- (2) ¹In addition, admission to the International Software Systems Science master's degree programme is open to applicants who possess a university degree or an equivalent degree with a standard period of study of at least six semesters comprising 180 ECTS points and an overall mark of 2.0 or better in a related degree programme according to § 31 which imparts competences comprising at least 115 ECTS points corresponding to the modules of module groups A1, A2, A3 and A4 of the University of Bamberg's Informatik: Software Systems Science bachelor's degree programme or of module groups A1, A2 and A3 of the Informatik bachelor's degree programme. ²The competences required according to sentence 1 include
 - competences in the fields of mathematics, theoretical foundations of computer science or formal software analysis comprising at least 34 ECTS points,
 - competences in the fields of programming, software engineering or algorithms and data structures comprising at least 33 ECTS points, which may include the bachelor's thesis in the field of computer science,
 - competences in the fields of database systems, computers and operating systems, information security, distributed systems, data communication, interactive systems or mobile systems comprising at least 36 ECTS points,
 - further competences in the field of mathematics or computer science comprising at least 12 ECTS points.
- (3) ¹Furthermore, admission to the International Software Systems Science master's degree programme requires English language proficiency at a level suitable for a programme taught in English. ²Proficiency is to be verified by certificates corresponding to at least IELTS 6.5 or TOEFL 90 iBT, or equivalent language certificates.
- (4) ¹Furthermore, applicants who did not complete their qualifying studies in a state that has signed the Convention on the Recognition of Qualifications concerning Higher Education in

the European Region of 11th April 1997 (Lisbon Convention) and whose overall mark according to paragraph 1 or paragraph 2 is worse than 1.5 must provide proof of the Graduate Record Examination (GRE) General Test or of a Graduate Aptitude Test in Engineering (GATE). ²The scores in the GRE must be at least 153 points in Verbal Reasoning, 164 points in Quantitative Reasoning and level 4.0 in Analytical Writing; in the GATE at least 500 points (GATE General Score).

- (5) ¹Applicants according to paragraph 1 shall be permitted to commence their studies before they have fulfilled the admission requirements according to paragraph 1, provided that at least 150 ECTS points of the qualifying degree programme are verified at the time of enrolment. ²Fulfilment of the admission requirements must be verified by the end of the second semester. ³If verification is not provided in due time, the student shall be exmatriculated ex officio. ⁴The exmatriculation shall take effect at the end of the second semester.
- (6) The application deadline for commencing studies in the winter semester ends on 15th July of the respective year. For commencing studies in the summer semester, the application deadline ends on 15th January of the respective year.

§34

Subject of the master's programme and monitoring of academic progress

- (1) ¹The International Software Systems Science master's degree programme leads to a further professionally qualifying university degree. ²During the programme, it is determined whether a student has acquired advanced and in-depth subject knowledge, has a firm understanding of the subject's contexts and possesses the ability to independently apply the subject's scientific methods and findings to the solution of complex problems and to develop them further through research.
- (2) In the programme, module examinations must be taken in the module groups listed in § 40, taking into account the specified elective options and including the completion of the master's thesis.
- (3) The module groups are assigned the ECTS points specified in Appendix 1.
- (4) In the course of their studies, students must earn in module group A1
 - a. a total of at least 18 ECTS points by the end of the second semester,
 - b. a total of at least 30 ECTS points by the end of the fourth semester.

§35

Master's thesis

- (1) The master's thesis is meant to verify that the examination candidate is capable of independently working on the assigned topic using scientific methods.
- (2) ¹The topic of the master's thesis shall be drawn from one of the subject groups specified in Appendix 2. ²Upon the examination candidate's request, the examining board may also approve a topic from another subject. ³In such a case, the examination candidate must satisfactorily show that the content of the proposed topic is drawn from Software Systems

Science.

- (3) ¹The master's thesis module includes a colloquium in which the principal findings of the thesis are defended. ²At the student's choice, the colloquium takes place either before or after the assessment of the master's thesis.
- (4) The mark for the master's thesis is composed of 67 % of the assessment of the written thesis and 33 % of the assessment of the colloquium in which the principal findings of the thesis are defended.
- (5) Admission to the master's thesis requires the successful completion of modules comprising at least 60 ECTS points.

§36

Specialisation field

¹The elective specialisation fields (S1 – S3) are listed in Appendix 1, module group A1. ²Upon application to the examining board, a specialisation field can be included in the transcript if

- a) the master's thesis in module group A4,
- b) a seminar or a project in module group A3 and, additionally,
- c) at least 18 ECTS points from module group A1

have been earned in the corresponding specialisation field.

§37

International experience

- (1) Students in the International Software Systems Science master's degree programme are strongly advised to complete structured studies abroad or an internship in an international context totalling at least 360 hours, usually in the second or third semester of study.
- (2) ¹Students are responsible for arranging their own internship or studies abroad. ²The University of Bamberg's International Office provides assistance with the arrangement of study places abroad within the framework of established university partnerships and available funding programmes. ³There is no entitlement to the allocation of a study place.
- (3) ¹An internship in an international context is a subject-specific internship in the professional field of software systems science, which is to be completed in an international context, preferably abroad. ²The internship may be completed in a foreign or internationally operating domestic enterprise (or research institution) in private or public ownership. ³An internship shall be chosen in such a way that the educational objectives of § 39 paragraph 1 are met. ⁴Verification of the internship shall take the form of a certificate issued by the organisational unit in which the internship was completed, as well as a written internship report of at least four DIN-A4 pages. ⁵The certificate and report are to be submitted together to the examining board. ⁶Diverging from sentence 2, students who have completed their qualifying studies entirely outside of Germany may also complete the internship at other domestic enterprises or research institutions.
- (4) ¹The examinations to be taken during the structured study period at a foreign institution of higher education should be agreed with the responsible examining board before beginning

the stay abroad (Learning Agreement). ²During studies abroad, modules can be completed which either correspond to a module offered at the University of Bamberg according to Appendix 1 of these study and subject examination regulations (no substantial differences with regard to the competences acquired) or can be systematically assigned to one of the module groups A1 to A3 according to Appendix 1. ³Credits already earned cannot be credited again from studies abroad. ⁴In all other respects, § 6 APO WIAI applies to the recognition of credits earned during studies abroad.

III. Programme prerequisites, objectives and structure

§38

Programme prerequisites

Courses and module examinations pursuant to these regulations shall be held and completed in English.

§39

Programme objectives

- (1) ¹Building consecutively on a relevant bachelor's degree programme, the master's degree programme provides specialisation in the field of software sciences as well as qualification for a research-related professional activity in the academic or industrial environment of computer science. ²The subject matter of software systems science comprises those fields of computer science that are required for the creation of complex distributed and networked software systems.
- (2) ¹Over the course of the degree studies, students gain knowledge, skills and competences not only in the fields of software systems science and computer science but also in the associated neighbouring and auxiliary disciplines. ²In this context, the integration of these various fields of knowledge with regard to topics in software systems science is of particular significance.
- (3) ¹The programme is both method- and project-oriented and is meant to prepare students for a diverse range of professional opportunities. ²The elective options in the core studies provide the opportunity for a specific orientation of the specialisation fields.
- (4) ¹Additionally, the programme is intended to convey the ability for continued self-education necessitated by the dynamic development of the software systems science field.
²Furthermore, the programme is designed to convey the competences necessary to contribute to the scientific advancement of the field within the context of research and development activities.
- (5) Based on its English-language courses, the programme provides the opportunity to utilise existing passive and active English language skills in the subject-specific context of software systems science and to acquire extensive knowledge of the technical English terminology used in this field.
- (6) The International Software Systems Science master's degree programme further strengthens the ability to work in international contexts by providing integrated optional studies abroad

or an optional subject-specific internship in an international context.

§40

Programme structure

- (1) Students in the International Software Systems Science master's degree programme acquire skills and expertise in the following five module groups:
 - A1: Software Systems Science
 - A2: Domain-specific Software Systems Science
 - A3: Seminar and Project
 - A4: Master's Thesis
 - A5: International Experience
- (2) ¹Module groups A1 and A2 offer the opportunity to specialise in software systems science and related computer science subjects. ²Modules from the module groups A2, A3 and A4 of the University of Bamberg's Informatik: Software Systems Science bachelor's degree programme or of the University of Bamberg's Informatik bachelor's degree programme in which the necessary subject-related prerequisites for modules of module groups A1 or A2 of the master's degree programme are conveyed can be selected in module groups A1 and A2 up to a total of 15 ECTS points. ³Modules that convey the respective subject-related prerequisites are listed in the module handbook under the heading 'Recommended prior knowledge'. ⁴Other modules from the bachelor's degree programme can be selected after a corresponding application to the examining board and if the prerequisites specified in sentence 2 are fulfilled.
- (3) ¹Within module group A1, depending on the current course offering, advanced modules from the subjects listed in Appendix 2 a) can be selected. ²In this context, at least 6 ECTS points must be earned in the specialisation fields S1 to S3 according to Appendix 1.
- (4) In module group A2, depending on the current course offering, advanced modules from related computer science subjects of relevance to software systems science can be selected.
- (5) ¹Module group A3 contains a seminar and a project in software systems science which expand on and apply the content of module groups A1 and A2. ²Within these courses, specific issues relating to software systems science are explored and discussed.
- (6) Module group A4 provides for the independent examination of an advanced topic from a subject of the computer science subject group or from another subject in accordance with Appendix 2 within the scope of the master's thesis.
- (7) In module group A5, there is the option to complete an internship in an international context and/or modules at a foreign university.

IV. Final provisions

§41

Entry into force

- (1) ¹These study and subject examination regulations enter into force on 1st October 2025. ²On the date these regulations enter into force, the Study and Subject Examination Regulations for the International Software Systems Science master's degree programme at the University of Bamberg of 24th September 2024 (citation: <https://www.uni-bamberg.de/fileadmin/abt-studium/amtliche-veroeffentlichungen/2024/2024-76.pdf>), last amended by the statutes of 31st March 2025 (citation: <https://www.uni-bamberg.de/fileadmin/abt-studium/amtliche-veroeffentlichungen/2025/2025-31.pdf>), cease to have effect.
- (2) Students who commenced their studies before the winter semester 2025/2026 shall complete their studies according to the regulations previously in force.
- (3) ¹Students who commenced the International Software Systems Science master's degree programme before the winter semester 2025/2026 may transfer to these regulations until 31st March 2026. ²The transfer is effected by a written declaration of the student, which must be received by the examining board within the deadline specified in sentence 1. ³If no transfer takes place, students shall complete their studies according to these regulations.

Appendix 1: Modules and module groups in the International Software Systems Science master's degree programme

¹120 ECTS points, including the master's thesis, must be earned for completion of the International Software Systems Science master's degree programme. ²The International Software Systems Science degree programme comprises the module groups A1 through A5. ³In accordance with the character of the degree programme, these module groups are defined as required elective areas that allow students to develop individual areas of specialisation. ⁴The ECTS points required in the degree programme are distributed among the module groups as follows.

Module group		ECTS
A1	Software Systems Science – S1: Theory – S2: Systems – S3: Software	30 – 69 6 – 30 6 – 30 6 – 30
A2	Domain-specific Software Systems Science	0 – 39
A3	Seminar and Project	9
A4	Master's Thesis (topics according to Appendix 2)	30
A5	International Experience	12 – 27
Total		120

1. Module Group A1 Software Systems Science

¹In module group A1, modules totalling between 30 and 69 ECTS points must be completed from the following offering.

ID	Module Title	ECTS	Examination
Required Elective Area S1 Theory: 6 to 30 ECTS points			
AlgoK-Algo-M	Algorithmen (Algorithms)	6	Written or oral examination
AISE-Auto	Automation of Logical Reasoning	6	Oral examination
AISE-UL	Universelle Logik & Universelles Schließen (Universal Logic & Universal Reasoning)	6	Written or oral examination
GdI-FPRS-M	Functional Programming of Reactive Systems	6	Written or oral examination
GdI-IFP-M	Introduction to Functional Programming	6	Written examination
ID	Module Title	ECTS	Examination
Required Elective Area S2 Systems: 6 to 30 ECTS points			
DT-CPP-M	Systemprogrammierung in C++ (System Programming in C++)	6	Portfolio
MOBI-DSC-M	Data Streams and Complex Event Processing	6	Written or oral examination
SYSNAP-OSE-M	Operating Systems Engineering	6	Oral examination
SYSNAP-Virt-M	Virtualisierung (Virtualization)	6	Written or oral examination
SYSNAP-PMAP-M	Processor Microarchitecture and Performance	6	Portfolio

ID	Module Title	ECTS	Examination
Required Elective Area S3 Software: 6 to 30 ECTS points			
DT-DBCPU-M	Datenbanksysteme für moderne CPU (Database Systems for Modern CPUs)	6	Written examination
ESE-ESEng-M	Evidence-based Software Engineering	6	Presentation with written term paper
MOBI-ADM-M	Advanced Data Management	6	Written examination
PSI-AdvaSP-M	Advanced Information Security and Privacy	6	Written examination
PSI-DiffPriv-M	Introduction to Differential Privacy	6	Written examination
SWT-ASV-M	Applied Software Verification	6	Term paper and colloquium

²The module catalogue for the required elective areas S1 to S3 can be expanded by comparable subject-related modules in the module handbook.

2. Module Group A2 Domain-specific Software Systems Science

¹In module group A2, modules totalling between 0 and 39 ECTS points must be completed from the following offering. The modules marked in the column 'rT' require regular participation.

ID	Module Title	ECTS	Examination	rT
DS-ConvAI-M	Advanced Dialogue Systems and Conversational AI	6	Oral examination	
EESYS-ES-M	Energy-Efficient Systems	6	Written examination	
EESYS-ADAML-M	Applied Data Analytics and Machine Learning in R	6	Written examination	
HCI-US-B	Ubiquitous Systems	6	Written or oral examination	
ISPL-MDP-M	Managing Digital Platforms	6	Written examination	
NLProc-DL4NLP-M	Deep Learning for Natural Language Processing	6	Written examination	
NLProc-EA-M	Emotion Analysis	6	Term paper and colloquium	
SNA-OSN-M	Project Online Social Networks	6	Term paper and colloquium	x
VIS-IVVA-M	Advanced Information Visualization and Visual Analytics	6	Written examination	
xAI-DL-M	Deep Learning	6	Written examination	
² The module catalogue for the required elective area can be expanded by comparable subject-related modules in the module handbook.				

3. Module Group A3 Seminar and Project

¹In module group A3, a seminar module comprising 3 ECTS points and a project module comprising 6 ECTS points in the field of software systems science must be completed. ²The seminar module examination takes the form of a presentation with a written term paper or a written term paper with a colloquium. ³The project module examination takes the form of a written term paper with a colloquium. ⁴Admission to the respective module examination requires regular attendance pursuant to § 9 paragraph 10 APO WIAI in the corresponding selected courses.

4. Module Group A4 Master's Thesis

¹In module group A4, the master's thesis module comprising 30 ECTS points must be completed in accordance with § 35. ²The module examination takes the form of a written thesis with a processing time of six months and a colloquium with an examination duration of 20 to 60 minutes.

5. Module Group A5 International Experience

In module group A5, modules comprising 12 to 27 ECTS points must be completed.

a. Required elective area: structured studies abroad

Modules comprising 0 to 27 ECTS points completed within the framework of structured studies at a foreign university can be included in required elective area a, provided that they differ substantially from the modules to be completed according to the specifications of these regulations and that their subject matter can be systematically assigned to module groups A1, A2 or A3.

b. Required elective area: internship

¹In required elective area b, an internship in an international context comprising 12 ECTS points can be completed. ²The internship must comply with the requirements of § 37.

ID	Module Title	ECTS	Examination
SSS-PraktIntKon-M	Praktikum im internationalen Kontext (International internship)	12	Internship report (not marked)

c. Required elective area: foreign languages

¹In required elective area c, modules comprising 0 to 15 ECTS points can be completed from the offering of the Bamberg Language Centre or at foreign universities in the context of structured studies abroad pursuant to § 37 paragraph 1. ²Modules in English and modules in the language in which the university entrance qualification was acquired are excluded. ³Details, in particular the modules available for selection as well as the respective module examinations and partial module examinations, are specified in the University of Bamberg's examination regulations and module handbook for practical language modules.

Appendix 2: Topics for the master's thesis in the International Software Systems Science master's degree programme

The topic of the master's thesis (credited with 30 ECTS points) may be drawn from one of the following subjects:

a) Subjects from the computer science subject group:

- Algorithms and complexity,
- Data engineering,
- Experimental software engineering,
- Foundations of computer science,
- Mobile software systems/mobility,
- Privacy and security in information systems,
- Computer networks,
- Software technologies and programming languages,
- Systems programming,
- Distributed systems.

b) Other subjects from the area of the International Software Systems Science master's degree programme with a connection to software systems science.

Concerning letter b), the topic is approved by the examining board upon application by the examination candidate. The application must satisfactorily show that the proposed topic exhibits a thematic connection to the International Software Systems Science master's degree programme.

Issued on the basis of the resolution of the Senate of the University of Bamberg of 16th July 2025 and the approval by the President of the University of Bamberg pursuant to Article 9 Sentence 3 BayHIG of 29th September 2025.

Bamberg, 29th September 2025

signed

Prof. Dr. Kai Fischbach
President

These statutes were set down in the University of Bamberg on 29th September 2025; the deposit was announced digitally on the same day via the website of the University of Bamberg designated for official publications. The date of promulgation is therefore 29th September 2025.