

Subject-Related Examination and Study Regulations for the Master's Degree Programme on Artificial Intelligence from 15 August 2022 as amended by the first amending statute of the Examination and Study Regulations for the Master's Degree Programme on Artificial Intelligence (M. Sc.) of 05 June 2024.

English translation, not legally binding!

In accordance with the Brandenburg Higher Education Act (Brandenburgisches Hochschulgesetz – BbgHG) of 28 April 2014 (GVBl. I/14 Nr. 18), last amended by the act of 23 September 2020 (GVBl. I/20, Nr. 26), according to Section 5 Paragraph 1 Sentence 2 in conjunction with Section 19 Paragraph 2 Sentence 1, Section 22 Paragraph 2 Sentence 1, Section 72 Paragraph 2 Sentence 1 BbgHG and Section 1 of the General Examination and Study Regulations for Master's Degree Programmes at the Brandenburg University of Technology Cottbus-Senftenberg from 12 September 2016 (AMbl. 14/2016), last amended by the first amending statutes of 26 January 2021 (AMbl. 02/2021), Brandenburg University of Technology Cottbus-Senftenberg (BTU) has adopted the following statutes:

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§ 1 Scope of Validity

¹These statutes outlines the subject-related specifics for the Master's Programme "Artificial Intelligence." ²It is a supplement to the General Examination and Study Regulations for Master's Degree Programmes at BTU (RahmenO-MA) from 12 September 2016 (AMbl. 14/2016) and the first amending statutes of 26 January 2021 (AMbl. 02/2021).

§ 2 Content Profile of the Programme, Goals of Studies

¹The international Master's degree program in Artificial Intelligence is a research-oriented degree program. ²Students are prepared for the diverse fields of activity in the field of artificial intelligence. ³Through a comprehensive education in the fundamentals of computer science and mathematics, students will acquire the mindset, knowledge and skills required in this field. ⁴They will learn how to model and process problems relating to the acquisition and processing of information, the representation of knowledge and information, as well as machine learning, planning and reasoning. ⁵The focus here is on the necessary algorithms and procedures as well as the necessary foundations. ⁶This enables them to cope with the constantly changing fields in professional arena. ⁷In particular, they will be able to design and develop complex artificial intelligence processes, test and validate their special properties, develop them further and implement them in a targeted manner. ⁸Furthermore, they will acquire the ability to critically scrutinize the prerequisites, limits and effects of applying artificial intelligence methods to socially relevant problems. ⁹They will have the skills and knowledge required to apply for admission for doctoral studies/Ph.D., too.

§ 3 Graduation, Degree

Upon successful completion of the Master Study Programme in Artificial Intelligence the academic degree "Master of Science" (M. Sc.) will be awarded.

§ 4 Special Admission and Enrolment Requirements

(1) ¹The primary admission requirement is a first qualifying degree (at least bachelor's degree) in a subject-related study programme. ²A degree is considered to be close in content if the degree programme in Computer Science, Mathematics, and Ethics is comparable in scope to the Bachelor's degree programme in Artificial Intelligence at BTU.

(2) ¹The Examination Board decides on the admission of applicants who do not have a Bachelor's degree in Artificial Intelligence. ²The examination board may grant admission with conditions regarding the completion of modules of the basic courses from the Bachelor's degree programme in Artificial Intelligence at BTU. ³The total number of credit points from the supplementary modules must not exceed 18 credit points. ⁴These supplementary modules cannot be credited towards the Master's degree programme.

(3) ¹The language of teaching and examination is English. ²For admission into the study programme it is required that students provide proof of sufficient English language skills according to Section 3 Paragraph 3 of the Enrolment Regulations from 22 January 2020 (AMbl. 01/2020) of the BTU.

(4) ¹The supplementary modules are generally in German, especially if they are a compulsory module in the Bachelor's degree program in Artificial Intelligence. In this case, prospective students are advised to ensure that their German language skills correspond to level B2.

§ 5 Regular Duration and Scope of the Programme

(1) ¹The regular duration of studies for this programme is 4 semesters, and comprises of completion of 120 credit points (CP), where one credit point corresponds to 30 hours of work.

²It is offered as a full-time study programme with an individual part-time study option in accordance with Section 6 RahmenO MA.

(2) The programme can be commenced in the summer or winter semester.

§ 6 Programme Structure and Organisation

(1) The Master's degree program in Artificial Intelligence comprises according to Annex 1:

- three Compulsory Elective Complexes

- Advanced Methods

This complex consists mainly of modules in Computer Science, Mathematics and Cognition. The modules deepen the understanding of the fundamentals, central methods, techniques and models on which modern artificial intelligence is based.

- Knowledge Acquisition, Representation, and Processing

This complex consists mainly of modules from Computer Science with additions from cognition. The modules deal with advanced concepts and methods of information processing, focusing on the abstraction of information from a signal, the isolation of the required information, and its encoding in a form that facilitates its use.

- Learning and Reasoning

This complex consists mainly of modules in Computer Science, Mathematics and Cognition. The modules deal with how organic and synthetic systems use their own experience or observed data to improve their performance (i.e., to learn) and to make decisions or derive behavioural rules.

- Seminars or Laboratories,

- General Studies - 6 CP,

- Internship - 10 CP,

- Master Thesis - 30 CP.

(2) ¹A minimum of 6 CP must be acquired in each of the three compulsory elective areas. ²A minimum of 6 CP and a maximum of 12 CP must be acquired from ungraded laboratories work and seminars in the compulsory elective area (coursework). ³A total of 74 CP must be acquired in the three compulsory elective areas and from ungraded laboratories work and seminars.

(3) ¹In addition to compulsory elective modules that can only be taken in the Master's degree programme, the three compulsory elective complexes also contain compulsory elective modules from the Bachelor's programme that correspond to the level of the Master's degree programme but could already be chosen as an option in the specialization of the Bachelor's degree programme, as well as modules that can be used by new students from related degree programmes to adapt their existing knowledge. ²Modules amounting to a maximum of 18 credit points can be credited from the modules according to sentence 1 in the Master's degree program. ³Modules that have been completed by the student in the respective Bachelor's degree programme cannot be completed again in the Master's degree programme.

(4) ¹If necessary, the range of compulsory elective modules can be adjusted on a semester-by-semester basis by the head of degree program in consultation with the examination board. ²The characteristics of the individual complexes must be taken into account. ³The ability to study within the standard period of study must be guaranteed in all cases. ⁴The head of degree program must submit a binding notification to the administration (Process Support of the Campus Management System) one month before the start of the semester in order to adjust the compulsory electives offered.

The modules in the compulsory elective catalogue are regularly published in the Information Portal Teaching.

(5) ¹By the end of the first semester, the student must submit to the examination board a study plan approved by the mentor assigned in accordance with Section 9 Paragraph 2 of RahmenO-MA, indicating the selection of compulsory elective modules in the three complexes and the individually selected semesters for taking the individual examinations. ²The mentor can be a university lecturer from the Institute of Computer Science, the Institute of Electrical Engineering and Information Technology, the Institute of Medical Technology or the Institute of Mathematics at BTU. ³The study plan must be submitted to Student Services by the end of the first semester at the latest. ⁴Changes must be confirmed by the mentor and approved by the examination board.

(6) ¹A change of mentor must be requested from the Examination Board, stating the reasons, and will be decided by the Examination Board after examining the reasons.

(7) ¹The professional internship of 10 CP has a duration of at least 260 working hours and should generally be carried out at an institution outside the university. ²Internships at central university facilities (e.g., university IT Centre) are permitted. ³Working Student jobs can be recognized by the examination board with the approval of the mentor if they correspond to the objectives of the internship. ⁴Details are regulated by the internship regulations (see Annex 3).

(8) ¹The professional internship is guided by the mentor and supervised by a supervisor at the relevant institution. ²The assignment of internship tasks is carried out by the supervisor in consultation with the mentor.

(9) ¹A written report on the internship must be submitted, describing the completed tasks and their solutions. ²The internship and the written report are assessed by the supervisor and the mentor. ³After a positive assessment, the mentor certifies that the internship has been successfully completed.

(10) ¹In justifiable cases, e.g., if no suitable professional internship place can be found despite adequate effort, the internship can be replaced by a project work of the appropriate scope in the fields of computer science. ²The examination board and the mentor must approve this.

(11) ¹In exceptional cases, the professional internship can be replaced by other modules from the compulsory elective complexes of "Advanced Methods," "Knowledge Acquisition, Representation, and Processing," or "Learning and Reasoning." ²The examination board and the mentor must approve this. ³Relevant exceptions are, for example

- relevant work experience, or

- successful completion of a professional internship in another study programme

(12) ¹A study abroad or an internship abroad is welcomed. ²Students are advised to seek individual academic counselling to determine the timing of their studies.

§ 7 Special Regulations for the Organisation of Examinations

There are no special regulations for the organisation of examinations.

§ 8 Master Thesis

(1) The Master's thesis has a completion time of 24 weeks and acquisition of 30 CP designed for full-time study.

(2) At the time the Master's thesis is submitted, at least 78 CP must have been acquired, including the CP for the professional internship.

(3) ¹The topic of the Master's thesis is usually issued by the mentor, who is usually also responsible for supervising the Master's thesis. ²With the consent of the mentor and the examination board, it is also possible for the topic to be issued and supervised by other university lecturers at BTU.

(4) ¹The Master's thesis shall be written in English. ²In exceptional cases, it may be written in German at the written request of the student with the consent of the thesis supervisor. ³The Examination Board shall decide on the request.

(5) ¹The Master's thesis is assessed by two examiners' report, one of which is written by the supervising university lecturer (first examiner). ²The second report is usually written by a second university lecturer.

(6) ¹For Master's thesis that are written in cooperation with external institutions, the second expert opinion may be written by another person involved in the supervision of the Master's thesis, whereby this person must have the qualification of an appropriate diploma or Master's degree. ²The Examination Board decides on exceptions.

(7) ¹The Master's thesis and the colloquium are generally open to the university public. ² Any restricted notes can only refer to appendices.

§ 9 Further Supplementary Regulations

There are no additional regulations.

§ 10 Entry into Force, Abrogation Regulations

(1) These regulations come into effect from the Winter semester 2022/23.

(2) These Examination and Study Regulations are no longer relevant 4 semesters after the established regular study duration of the programme and the final enrolment.

Issued on the basis of the decisions made by the Faculty Council of Faculty 1 – MINT – Mathematics, Computer Science, Physics, Electrical Engineering and Information Technology held on 03 February 2021, 21 July 2021, and 13 July 2022, the opinion provided by the Senate on 15 July 2021 and the approval of the President of Brandenburg University of Technology Cottbus-Senftenberg given on 20 December 2021, and the approval of the Ministry of Science, Research and Culture of the Federal State of Brandenburg given on 06 May 2022.

First amendment statute issued on the basis of the resolution of the Faculty Council of Faculty 1 - STEM - Mathematics, Computer Science, Physics, Electrical Engineering and Information Technology held on 17 January 2024, the opinion provided by the Senate on 15 February 2024 and the approval of the President of the Brandenburg University of Technology Cottbus-Senftenberg given on 05 June 2024.

Annex 1: Overview of the Modules, Status, Credit Points (CP)

Module Nr.	Compulsory Elective Complex/ Modules	Status	Evaluation	CP
	Advanced Methods	WP	Examination	6 - 56
	Knowledge Acquisition, Representation, and Processing	WP	Examination	6 - 56
	Learning and Reasoning	WP	Examination	6 - 56
	Seminars or Laboratories	WP	Study Performance	6 -12
	General Studies	WP	Examination	6
13602	Internship	P	Study Performance	10
13600	Master Thesis	P	Examination	30
	Total			120

P = Mandatory, WP = Compulsory Elective

Modules for adapting existing knowledge according to § 6 (3) must be agreed individually with the mentor and the examination board.

Annex 1a Compulsory Elective Complex “Advanced Methods”

Module Nr.	Module Title	Status	CP	Evaluation
11509	Designing and Understanding Psychological Experiments	WP	6	Exam
13500	Introduction to Neural Signal Analysis	WP	6	Exam
11886	Dependability and Fault Tolerance	WP	6	Exam
11889	Introduction into Cyber Security	WP	6	Exam
13490	Secure Cyber-Physical Systems	WP	6	Exam
12464	Modeling and Simulation of Discrete Systems	WP	6	Exam
13354	Practical applications of Neuroergonomics	WP	6	Exam

13849	Introduction to Computational Neuroscience	WP	6	Exam
13357	Psychophysiology: Theory and Data Analysis	WP	6	Exam
11885	Software Testing	WP	8	Exam
13220	Modeling in Mixed-Integer Optimization	WP	6	Exam
13843	Scientific Computing	WP	8	Exam
13844	Functional Analysis	WP	8	Exam

Annex 1b Compulsory Elective Complex “Knowledge Acquisition, Representation, and Processing”

Module Nr.	Module Title	Status	CP	Evaluation
13842	Virtual Reality and Agents	WP	6	Exam
11881	Foundations of Data Mining	WP	6	Exam
13813	Logic in Databases	WP	6	Exam
13838	Information Retrieval	WP	6	Exam
13839	Advanced Database Models	WP	6	Exam
13840	Data Warehouses	WP	6	Exam
13841	Speech Processing	WP	6	Exam
13668	Sensorimotor Processing in Health and Disease	WP	6	Exam

Annex 1c Compulsory Elective Complex “Learning and Reasoning”

Module Nr.	Module Title	Status	CP	Evaluation
13846	Learning in Real and Virtual Humans	WP	6	Exam
13335	Brain-Computer Interfaces (BCIs) for Neuroadaptive Technology	WP	6	Exam
12826	Mathematical Data Science	WP	8	Exam
13352	Mathematics of Neuroadaptive Technology	WP	6	Exam
13355	Practical Skills for Brain-Computer Interfaces	WP	4	Study Performance
11333	Optimierung II	WP	8	Exam

11847	Neural Networks and Learning Theory	WP	8	Exam
13847	Cognitive Systems: Behaviour Control	WP	6	Exam
12472	Einführung in die Constrained-Programmierung	WP	6	Exam

Annex 2: Regular Study Plan (Example)

Compulsory Elective Complexes/Modules	Semesters				CP Total
	1	2	3	4	
Advanced Methods	6	8	14		28
Knowledge Acquisition, Representation and Processing	12	18			30
Learning and Reasoning	6				6
Seminars or Laboratories		4	6		10
General Studies	6				6
Internship			10		10
Master Thesis				30	30
Total Sum of Studies	30	30	30	30	120

Annex 3: Internship Regulations

1. Validity

These regulations apply to the compulsory professional internship of the Master's degree program in Artificial Intelligence at the Brandenburg University of Technology Cottbus-Senftenberg in conjunction with the valid examination and study regulations.

2. Purpose of the Internship

¹The professional internship is designed to apply and implement the specialist and methodological knowledge acquired during the studies in practice. ²This includes, in particular, working in a team. ³The internship also serves to provide feedback between industrial practice on the one hand and research and teaching on the other. ⁴The students are responsible for finding suitable work placements. ⁵Chairs can and should provide assistance in finding placements in order to facilitate this feedback. ⁶A possible non-disclosure agreement (NDA) must be concluded before the start of the internship.

3. Registration

¹The internship must be approved by the mentor at least four weeks before the start of the internship. ²The approval includes the topic, the host company and the supervising person in the company and, if applicable, a confidentiality agreement or non-disclosure agreement. ³The internship must be registered with Student Services Office no later than five working days after it begins.

4. Internship Abroad

¹The implementation of internships abroad is expressly welcomed. ²However, they are subject to the same guidelines as internships in Germany. ³Please refer to the exchange programs and internship placements offered by the German Academic Exchange Service (DAAD).

5. Internship Places

¹Potentially suitable company include companies that are active in the field of computer science, but also research institutions that are independent of universities (e.g., institutes of the Fraunhofer Society).

²In exceptional cases, internships at higher education institutions (e.g., IT centres in universities) may be approved. ³The interning student should receive mentoring from supervisor that is employed by the company or institution, and has earned a Diploma or Master's degree in a relevant field. ⁴This supervisor must be named in the report and be available as a contact person. ⁵He or she should guide the student's work and be available for questions and make recommendations.

6. Supervision

¹The supervision on the BTU's side is the responsibility of the mentor. ²Research assistants are permitted to assist in the supervision. ³Regular consultations between the mentor at the BTU and the corresponding supervisor at the external institution are desired and envisaged.

7. Duration and Distribution of the Internship

¹The internship must have a duration of at least 260 working hours. ²If possible, it should be completed without interruptions. ³Longer periods of absence due to illness must be made up for, shorter periods will be decided by the examination board. ⁴If necessary, sick notes must be submitted to the internship company. ⁵It is recommended that a time schedule and a journal be kept during the internship.

8. Internship Report

¹For the whole duration of the internship it is required that the student writes a report (approx. 3500 to 4000 words) and submitted to the supervisor at the company. ²This report must meet the general requirements for academic/scientific papers. ³The report must be written in English. ⁴With the permission of the mentor, it may also be written in German. ⁵It should describe:

- the company where the internship takes place,
- the sector that company operates in and if relevant the department within the company,
- tasks, the existing state of the technology,
- approach, solution,
- reflection on one owns works, experiences, knowledge gained, applicability of knowledge/skills from the study programme etc.

⁶The report must be signed by the supervisor at the company before it is submitted at the BTU. ⁷An internship certificate an also be issued. ⁸The report must be submitted to the mentor at the BTU no later than eight weeks after the end of the internship.

⁹The written internship report is approved by the mentor at the BTU for the purpose of crediting the planned 10 CPs and is signed by the mentor, too.