Subject-Related Examination and Study Regulations for the Master's Degree Programme on Artificial Intelligence from 15 August 2022

English translation, not legally binding!

In accordance with the Brandenburg Higher Education Act (Brandenburgisches Hochschulgesetz – BbgHG) of 28 April 2014 (GVBI. I/14 Nr. 18), last amended by the act of 23 September 2020 (GVBI. 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

[1]These statutes outlines the subject-related specifics for the Master's Programme "Artificial Intelligence." [2]It 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 statues of 26 January 2021 (AMbl. 02/2021).

§ 2 Content Profile of the Programme, Goals of Studies

[1]The international Master's degree program in Artificial Intelligence is a research-oriented degree program. [2]Students are prepared for the diverse fields of activity in the field of artificial intelligence. [3]Through a comprehensive education in the fundamentals of computer science and mathematics, students will acquire the mindset, knowledge and skills required in this field. [4]They 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. [5]The focus here is on the necessary algorithms and procedures as well as the necessary foundations. [6]This enables them to cope with the constantly changing fields in professional arena. [7]In 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. [8]Furthermore, they will acquire the ability to critically scrutinize the prerequisites, limits and effects of applying artificial intelligence methods to socially relevant problems. [9]They 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) [1]The primary admission requirement is a first qualifying degree (at least bachelor's degree) in a subject-related study programme. [2]A 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) [1]The Examination Board decides on the admission of applicants who do not have a Bachelor's degree in Artificial Intelligence. [2]The 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. [3]The total number of credit points from the supplementary modules must not exceed 18 credit points. [4]These supplementary modules cannot be credited towards the Master's degree programme.

(3) [1]The language of teaching and examination is English. [2]For 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) [1]The 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) [1]The 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.

[2]It 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) [1]A minimum of 6 CP must be acquired in each of the three compulsory elective areas. [2]A 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). [3]A total of 74 CP must be acquired in the three compulsory elective areas and from ungraded laboratories work and seminars.

(3) [1]In 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. [2]Modules amounting to a maximum of 18 credit points can be credited from the modules according to sentence 1 in the Master's degree program. [3]Modules 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) [1]If 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. [2]The characteristics of the individual complexes must be taken into account. [3]The ability to study within the standard period of study must be guaranteed in all cases. [4]The 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) [1]By 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. [2]The 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. [3]The study plan must be submitted to Student Services by the end of the first semester at the latest. [4]Changes must be confirmed by the mentor and approved by the examination board.

(6) [1]A 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) [1]The professional internship of 10 CP has a duration of at least seven weeks and should generally be carried out at an institution outside the university. [2]Internships at central university facilities (e.g., university IT Centre) are permitted. [3]Working Student jobs may be recognized if they correspond to the objectives of the internship. [4]Details are regulated by the internship regulations (see Annex 3).

(8) [1]In exceptional cases, e.g., in the case of previous professional activity after the Bachelor's degree, the professional internship can be replaced by other modules from the compulsory elective catalogue. [2]This requires the approval of the examination board after consultation with the mentor.

(9) [1]A study abroad or an internship abroad is welcomed. [2]Students 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) [1]The topic of the Master’s thesis is usually issued by the mentor, who is usually also responsible for supervising the Master’s thesis. [2]With 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) [1]The Master's thesis shall be written in English. [2]In exceptional cases, it may be written in German at the written request of the student with the consent of the thesis supervisor. [3]The Examination Board shall decide on the request.

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

(6) [1]For 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. [2]The Examination Board decides on exceptions.

(7) [1]The 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.

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

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

3. Registration

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

4. Internship Abroad

[1]The implementation of internships abroad is expressly welcomed. [2]However, they are subject to the same guidelines as internships in Germany. [3]Please refer to the exchange

programs and internship placements offered by the German Academic Exchange Service (DAAD).

5. Internship Places

[1]Potentially suitable company include companies that are active in the field of information technology and media technology, but also research institutions that are independent of universities (e.g., institutes of the Fraunhofer Society). [2]In exceptional cases, internships at higher education institutions (e.g., IT centres in universities) may be approved. [3]The 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. [4]This supervisor must be named in the report and be available as a contact person. [5]He or she should guide the student's work and be available for questions and make recommendations.

6. Supervision

[1]The supervision on the BTU's side is the responsibility of the mentor. [2]Research assistants are permitted to assist in the supervision. [3]Regular 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

[1]The internship must have a duration of at least seven weeks. [2]If possible, it should be completed without interruptions. [3]A week of interning corresponds to the regular work week at the company providing the internship. [4]Longer periods of absence due to illness must be made up for, shorter periods will be decided by the examination board. [5]If necessary, sick notes must be submitted to the internship company. [6]It is recommended that a time schedule and a journal be kept during the internship.

8. Internship Report

[1]For 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. [2]This report must meet the general requirements for academic/scientific papers. [3]The report must be written in English. [4]With the permission of the mentor, it may also be written in German. [5]It 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.

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

[9]The 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.