UNIVERSITY OF PASSAU

Faculty of Computer Science and Mathematics

Subject-specific Study and Examination Regulation

B.Sc. Artificial Intelligence

of 4 June 2025

Subject-specific Study and Examination Regulation for the degree programme “Artificial Intelligence” leading to the award of the degree of Bachelor of Science at the University of Passau

of 4 June 2025

On the basis of Art. 9 sentence 1 in conjunction with Art. 80(1) sentence 1 and Art. 84(2) sentence 1 of the Bavarian Higher Education Innovation Act (BayHIG) of 5 August 2022 (GVBl. p. 414, BayRS 2210-1-3-WK), as last amended by § 14 of the Act of 23 June 2024 (GVBl. p. 605) and by § 8 of the Act of 23 July 2024 (GVBl. p. 632), the University of Passau issues the following regulation:

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§ 1 Scope

[1]The present Subject-specific Study and Examination Regulation (FStuPO) supplements the General Study and Examination Regulation for the Bachelor’s Degree Programmes (AStuPO) of the Faculty of Computer Science and Mathematics, as last amended. [2]If it is found that a provision of this regulation is incompatible with a provision of the AStuPO, the provision of the AStuPO shall take precedence.

§ 2 Object and aims of the degree programme

(1) The Faculty of Computer Science and Mathematics at the University of Passau offers the degree programme “Artificial Intelligence” leading to the award of the degree of Bachelor of Science.

(2) [1]Artificial intelligence (AI) is a key technology that has the potential to play a major role in shaping economic and technological developments in our society. [2]Given the continuous development and expansion of AI-based technologies, there are many attractive career prospects for experts in this field within various sectors (e.g. industry, trade, insurance, services, management consultancy, public administration and research and development). [3]This bachelor's degree programme in artificial intelligence is designed to meet these requirements and offers training in core areas of artificial intelligence, such as modelling

complex problems, representing and processing data, algorithmic AI-based methods (such as machine learning, deep learning, neural networks, transformers) as well as language models and multi-agent systems. [4]Students furthermore acquire the mathematical and theoretical foundations for analysing and optimising existing AI concepts and AI algorithms as well as for designing new AI processes. [5]Students acquire both practical knowledge and the skills to think in abstract structures and to evaluate AI-based solutions on the basis of generally applicable criteria. [6]The programme places particular emphasis on fundamental, science-led training in methods and theoretical aspects of artificial intelligence in the broadest sense, with its manifestations in areas such as the mathematical foundations of AI, logic, machine learning and the practical implementation and application of these methods in the fields of software engineering, databases and information systems, data and knowledge engineering and computational linguistics. [7]In addition, students acquire basic knowledge of the legal and ethical aspects of AI. [8]Depending on their chosen secondary subject, students can also acquire in-depth knowledge in the areas of business administration and foreign languages (German and English as a Foreign Language), whereby students whose prior education was not completed in German are prepared for the requirements of the German labour market. [9]Those graduating from the B.Sc. Artificial Intelligence degree programme have the essential scientific qualification for any activity related to artificial intelligence.

(3) The language of instruction is English.

§ 3 Admission requirements

Applicants who obtained their higher education entrance qualification within the meaning of Art. 88(1) BayHIG in a country that is not a member state of the European Union or the European Economic Area must, in accordance with § 4(1) sentence 2 AStuPO, prove their aptitude for the B.Sc. Artificial Intelligence programme by completing one of the following aptitude tests and attaining the respective minimum ratings, scores or percentile ranks:

1. Scholastic Assessment Test (SAT) with a score of at least 1240

2. Digital or paper-based Test for Academic Studies (TestAS) with a percentile rank of 80 in the core module or in the specialised modules Mathematics, Computer Science and Natural Sciences

3. American College Testing (ACT) programme with a minimum score of 25 in the overall assessment (composite) or in the STEM sub-area

4. Joint Entrance Examination (JEE):
    a. JEE-Main with an NTA score of at least 80 or
    b. JEE-Advanced rated “qualified”

5. College Scholastic Ability Test (CSAT; Suneung) with a score of “Grade 3” or better

§ 4 Content of the degree programme

[1]The degree programme consists of the compulsory subject Artificial Intelligence, one compulsory elective and three electives. [2]As a compulsory elective, students can choose either

- Advanced AI – Applied

  or

- Advanced AI – Theoretical

[3]The following electives are available:

1. In the computer science and mathematics area:
   - Advanced AI – Applied (if not already chosen as a compulsory elective)
   - Advanced AI – Theoretical (if not already chosen as a compulsory elective)
   - Theoretical Foundations of AI – Random Structures and Dynamics
   - Theoretical Foundations of AI – Algorithms and Optimisation
   - Natural Language Processing and Multilingual Computational Linguistics
   - Software Engineering
   - Visual Computing and Data Science
2. In the Business, Legal Aspects and Languages area:
   - Business Analytics
   - Entrepreneurship
   - Regulation of AI and Data
   - German as a Foreign Language
   - English as a Foreign Language

[4]The Board of Examiners may specify additional electives in the module catalogue, particularly from areas where artificial intelligence is relevant.

§ 5 Bachelor's examination

(1) The bachelor's examination consists of:

1. module examinations in the modules listed in § 6(3) to (5)

and

2. the bachelor's dissertation

(2) [1]In order to pass the bachelor's examination for the B.Sc. Artificial Intelligence programme, students must achieve a pass mark:

a) in all compulsory modules in the core Artificial Intelligence area in accordance with § 6(3), amounting to 107 ECTS credits

b) in modules amounting to at least 16 ECTS credits in the chosen compulsory elective as per § 6(4)

c) in accordance with sentences 2 to 5, modules amounting at least 45 ECTS credits from three chosen electives as per § 6(5)

d) and the bachelor's dissertation (which amounts to 12 ECTS credits)

and, furthermore, accumulate a total of 180 ECTS credits on the degree programme. [2]In the electives referred to in sentence 1 letter c, students must complete modules amounting to a minimum of 10 ECTS credits in total. [3]At least one elective from the computer science or mathematics area (§ 6(5) sentence 1) must be chosen. [4]Students cannot choose the electives *German as a Foreign Language* or *English as a Foreign Language* if German or, respectively, English was their language of their prior education; only one of the two electives can be chosen. [5]Students whose prior education was not completed in German must take the elective *German as a Foreign Language* and complete modules amounting to at least 20 ECTS credits.

§ 6 Module groups and modules

(1) [1]All modules, with the exception of the Counselling Module in the module group *Foundations of Computer Science & Programming*, are examination modules and are graded. [2]The final grade is calculated based on the module marks in accordance with § 7 sentence 3 and the mark attained on the bachelor's dissertation, each weighted according to their ECTS credit load.

(2) [1]In the modules and module groups listed in subsections (3) to (5), students must complete course-integrated assessments (continuous assessment). [2]The type and duration of each module assessment is indicated in the module catalogue in accordance with § 6(4) sentence 1 AStuPO. [3]In the *Mathematics & Theoretical Computer Science* module group, all modules separated by the word "or" are compulsory elective modules; the Theoretical Computer Science module is a compulsory module in that module group.

(3) [1]The compulsory subject Artificial Intelligence consists of the following module groups:

Module group *Foundations of Computer Science & Programming*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Foundations of Computer Science	Written or oral exam	5	7
(L) and (E)	Programming I	Written or oral exam	4	6
(L) and (E)	Programming for Data Analytics	Written or oral exam	5	6
(L) and (E)	Algorithms and Data Structures	Written or oral exam	5	9
In total: 4 modules			**19**	**28**

Module group *Mathematics & Theoretical Computer Science*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Mathematics for Computer Science I or Linear Algebra I	Written or oral exam	6	9
(L) and (E)	Mathematics for Computer Science II or Analysis I	Written or oral exam	6	9
(L) and (E)	Mathematics for Computer Science III or Introduction to Stochastics	Written or oral exam	6	9
(L) and (E)	Theoretical Computer Science	Written or oral exam	6	7
In total: 4 modules			**24**	**34**

Module group *Foundations of AI*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Foundations of AI: Machine Learning	Written or oral exam	3	5
(L) and (E)	Foundations of AI: Deep Learning	Written or oral exam or portfolio	3	5
(L) and (E)	Foundations of AI: Probabilistic Machine Learning	Written or oral exam	3	5
(L) and (E)	Foundations of AI: Multiagent Systems	Written or oral exam or portfolio	3	5
In total: 4 modules			**12**	**20**

Module group *Responsible AI*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L)	Ethical Aspects of AI	Written exam	2	3
(L)	Legal Aspects of AI	Written exam	1	3
In total: 2 modules			**3**	**6**

Module group *AIP, Seminar and Presentation*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(S)	AI Seminar	Portfolio (essay/paper and presentation)	2	4
(P)	AI Project (AIP)	Portfolio	6	10
(L) or (E) or (S)	Counselling Module	Portfolio or written exam	1	2
(Pr)	Presentation Bachelor Thesis (presentation of the dissertation)	Oral exam	–	3
In total: 4 modules			**9**	**19**

[2]Suitable seminars and the module catalogue are determined by the Board of Examiners and announced via the usual channels at the start of the semester. [3]In order to register for the Presentation Bachelor Thesis module, the bachelor's dissertation must have already been handed in pursuant to § 21(5) AStuPO.

(4) [1]The compulsory elective Advanced AI – Applied consists of the following modules:

Compulsory elective module group *Advanced AI – Applied*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Data Base and Information Systems I	Written or oral exam	3	5
(L) and (E)	Software Engineering	Written or oral exam	3	5
(L) and (E)	Data and Knowledge Engineering	Written or oral exam	4	6
In total: 3 modules			**10**	**16**

[2]The compulsory elective Advanced AI – Theoretical consists of the following modules:

Compulsory elective module group *Advanced AI – Theoretical*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Analysis II	Written or oral exam	6	9
(L) and (E)	Mathematics of Machine Learning	Written or oral exam	4	7
In total: 2 modules			**10**	**16**

(5) [1]The following module groups from the computer science and mathematics area can be chosen as electives:

Elective module group *Advanced AI – Applied*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Data Base and Information Systems I	Written or oral exam	3	5
(L) and (E)	Software Engineering	Written or oral exam	3	5
(L) and (E)	Data and Knowledge Engineering	Written or oral exam	4	6
In total: 2 or 3 modules			**6–10**	**10–16**

Elective module group *Advanced AI – Theoretical*

Course format	**Module title**	**Assessment**	**WCH**	**ECTS**
(L) and (E)	Analysis II	Written or oral exam	6	9
(L) and (E)	Mathematics of Machine Learning	Written or oral exam	4	7
In total: 2 modules			**10**	**16**

Elective module group *Theoretical Foundations of AI – Random Structures & Dynamics*

This module group imparts the theoretical foundations of probability theory, statistics, simulation and stochastics with reference to AI.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	3–9 each
In total		**at least 10**

Elective module group *Theoretical Foundations of AI – Algorithms and Optimisation*

This module group imparts the theoretical foundations for basic optimisation methods and algorithms in the field of AI.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	3–9 each
In total		**at least 10**

Elective module group *Natural Language Processing and Multilingual Computational Linguistics*

This module group imparts the principles of computer-aided analysis, comparison and processing of natural languages.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	5–9 each
In total		**at least 10**

Elective module group *Software Engineering*

This module group imparts foundational knowledge in the areas of programming paradigms, software testing and parallel programming.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	5–9 each
In total		**at least 10**

Elective module group *Visual Computing and Data Science*

This module group imparts the foundations of computer-aided imaging methods, algorithmic methods for large amounts of data and SQL-based methods.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	5–9 each
In total		**at least 10**

[2]The following module groups from the areas of Business, Legal Aspects and Languages can be chosen as electives:

Elective module group *Business Analytics*

This module group imparts the principles of econometrics and data-supported modelling and optimisation of business, financial and management systems.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	5–9 each
In total		**at least 10**

Elective module group *Entrepreneurship*

This module group imparts the principles of entrepreneurship and places a strong focus on marketing strategies, market analysis, transformation processes and ethical aspects.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	5–9 each
In total		**at least 10**

Elective module group *Regulation of AI and Data*

This module group imparts the legal principles in the area of data, IT and AI, for example in the areas of data protection, copyright, media law and the use of AI in criminal law.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	5–9 each
In total		**at least 10**

Elective module group *German as a Foreign Language*

Based on their initial language level (as determined in a placement test), students should aim to increase their German proficiency by two or three levels in order to better understand and write German texts and to enable them to present and discuss in German, which will also boost their employability on the German labour market after graduation.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	10 each
In total		**20**

Elective module group *English as a Foreign Language*

Based on their initial language level (as determined in a placement test), students should aim to increase their English proficiency by two or three levels in order to better understand and write English texts and to enable them to present and discuss in English, which will be beneficial for their scientific work.

	Assessment	**ECTS**
Compulsory elective modules	Written or oral examination or portfolio or lab report	10 each
In total		**20**

[3]Suitable compulsory elective modules, other than those specified in the tables in sentences 1 and 2, will be announced in the module catalogue in accordance with § 6(4) AStuPO.

§ 7 Certificate

[1]Proof of successful completion of the modules specified in § 5(2) must be enclosed with the application in accordance with § 24(1) sentence 1 AStuPO. [2]If more compulsory elective modules have been completed than are required, the student must indicate which of the compulsory elective modules are to be included in the final grade in accordance with § 6(3) sentence 2 AStuPO when submitting the application in accordance with § 24(1) sentence 1 AStuPO. [3]Furthermore, in accordance with § 6(5) sentence 2 AStuPO, the candidate may, when submitting the application for each module group in accordance with § 6(3) and (5), specify a maximum of one examination module that is not to be included in the final grade, with the exception of the module group AIP, Seminar and Presentation in accordance with § 6(3) sentence 1.

§ 8 Effective date

[1]The present regulation shall enter into force on 1 April 2025. [2]It applies for the first time to students commencing their studies at the University of Passau in winter semester 2025–26.

Issued as per the resolution of the Senate of the University of Passau of 7 May 2025 and as approved on 4 July 2025 by the Vice President acting on behalf of the President of the University of Passau (reference number V/S.I-10.3930/2025).

Passau, 4 June 2025

UNIVERSITY OF PASSAU
Vice President

Professor Harald Kosch

This regulation was issued by the University on 4 June 2025 and announced on 4 June 2025 by posting on the University's noticeboards.

The date of promulgation is 4 June 2025.