

Degree program and examination regulations for the Bachelor's degree program in Artificial Intelligence (Bachelor of Science) at the Faculty of Engineering at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

– FPOBScAI –

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Based on the currently valid version of Section 9 (1) in conjunction with Section 80 (1)(1), Section 84 (2)(1), Section 88 (9)(1), and Section 96 (3)(1) Bavarian Higher Education Innovation Act (**BayHIG**) dated August 5, 2022, Friedrich-Alexander-Universität Erlangen-Nürnberg enacts the following degree program and examination regulations:

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Part I: General Provisions

Section 1 Scope

The degree program and examination regulations for the Bachelor's degree program in Artificial Intelligence (Bachelor of Science) supplement the current version of the General Degree Program and Examination Regulations for Bachelor's and Master's Degree Programs at the Faculty of Engineering at FAU (**ABMPO/TF**).

Section 2 Bachelor's Degree Program, Degree Programs in Equivalent Subjects, Teaching and Examination Language, Language Requirements

(1) ¹The Bachelor's degree program in Artificial Intelligence consists of modules worth 180 ECTS credits. If it is studied full-time, it takes six semesters to complete (see **Appendix 1**), and twelve semesters if studied part-time (see **Appendix 2**). ²This includes the period for working on the Bachelor's thesis.

(2) ¹Subject-related degrees within the meaning of Section 28 (1)(2)(2) **ABMPO/TF** are Bachelor's degrees in computer science, data science or medical engineering. ²In justified cases, the Degree Program Committee may allow exceptions from sentence 1.

(3) ¹Notwithstanding Section 3 (6)(1) **ABMPO/TF**, the teaching and examination language in the Bachelor's degree program in Artificial Intelligence is English. ²Individual courses and examinations that are not compulsory modules may be conducted in German. ³This shall not affect the rest of Section 3 (6) **ABMPO/TF**.

(4) In order to enroll on the Bachelor's degree program in Artificial Intelligence, applicants must provide proof of proficiency in English equivalent to level B1+ of the Common European Framework of Reference for Languages (CEFR) (B1+ for language proficiency, B2 for reading skills).

Part II: Special Provisions

1. Bachelor's Examination

Section 3 Structure of the Bachelor's Degree Program

¹The Bachelor's degree program in Artificial Intelligence consists of compulsory modules (modules B1 to B13 and B19), compulsory elective modules (module groups and modules B14 to B17) and key qualifications (module group B18). ²Details are set forth hereinafter and in **Appendix 1** and **Appendix 2** respectively.

Section 4 Grundlagen- und Orientierungsprüfung (GOP)

In order to pass the Grundlagen- und Orientierungsprüfung examination, students must acquire at least 30 ECTS credits from modules B1, B2, B3, B6, B7 and B9 pursuant to **Appendix 1** or **Appendix 2** respectively.

Section 5 Module Group B14 – Application Domain Fundamentals

(1) ¹In module group B14 (Application domain fundamentals) students choose modules worth a total of 20 ECTS credits from a catalog stipulated by the Degree Program Committee. ²The elective modules available are published each semester in a module catalog in accordance with local practice.

(2) ¹The overriding learning outcome of the module group Application domain fundamentals is to allow students to gain knowledge that will allow them to specialize in an area of application of their own choice within the field of artificial intelligence (areas in medicine, natural science, computer science, engineering, social sciences or the humanities where AI-assisted data analysis can be used). ²The second learning outcome has a research focus, with students learning basic knowledge of the areas of application for artificial intelligence. ³Thirdly, the element of choice allows students to tailor their profile in view of their career plans. ⁴The specific learning outcomes for the individual modules depend on the chosen module and the respective module description.

(3) ¹The type and scope of examinations depend on the skills taught in the modules that are worth 5, 7.5, or 10 ECTS credits, or depending on the student's choice, also worth 2.5 ECTS credits. The type and scope of examinations are described in the module handbook. ²One examination achievement is stipulated per module. ³Examinations in the modules shall take one of the following forms: written examination (60, 90, 120

min) or project report. ⁴Section 7 (2)(3) **ABMPO/TF** stipulates that in justified exceptional circumstances, combinations of the individual achievements stated in sentence 3 may also be possible. ⁵The type, length and scope of the examinations in modules taken from other degree programs are stipulated in the applicable **degree program and examination regulations**. ⁶In individual instances the type and scope of the examination in imported modules may vary from the options stipulated in sentence 3; in these cases, one additional examination type, i.e. implementation and report (5-8 and 20-25 pages respectively), seminar achievements pursuant to Section 7 (3) **ABMPO/TF**, a written examination (45 min) or a case study (3-5 pages) is permitted as an alternative type of examination.

(4) ¹Compulsory elective modules amounting to 5 ECTS credits usually consist of a lecture (2 SWS) and a tutorial (2 SWS) or a lecture (3 SWS) and a tutorial (1 SWS). ²Any exceptions (and further details on module credits) are provided in the module handbook.

Section 6 Module Group B15 – Artificial Intelligence Electives

(1) ¹In module group B15 (Artificial intelligence electives), students select modules worth a total of 30 ECTS credits from a catalog stipulated by the Degree Program Committee. ²The elective modules available are published each semester in a module catalog in accordance with local practice.

(2) ¹The overriding learning outcome of the module group B15 (Artificial intelligence electives) is to allow students to gain a deeper understanding of specific areas of artificial intelligence, in particular with reference to the key research areas of the Department AIBE (biomedical imaging and sensing, health data science, medical robotics). ²The second learning outcome has a research focus in which research methods are taught in more detail, allowing students to explore their subject in more depth. ³Thirdly, the element of choice allows students to tailor their profile in view of their career plans. ⁴The specific learning outcomes for the individual modules depend on the chosen module and the respective module description.

(3) ¹The type and scope of examinations depend on the skills taught in the modules that are worth 5, 7.5, or 10 ECTS credits, or depending on the student's choice, also worth 2.5 ECTS credits. The type and scope of examinations are described in the module handbook. ²One examination achievement is stipulated per module. ³Examinations in the modules shall take one of the following forms: written examination (60, 90, 120 min), oral examination 20 to 30 min), tutorial achievement or laboratory achievement pursuant to Section 7 (3) **ABMPO/TF**. ⁴Section 7 (2)(3) **ABMPO/TF** stipulates that in justified exceptional circumstances, combinations of the individual achievements stated in sentence 3 may also be possible.

(4) ¹Compulsory elective modules amounting to 5 ECTS credits usually consist of a lecture (2 SWS) and a tutorial (2 SWS) or a lecture (3 SWS) and a tutorial (1 SWS). ²Any exceptions (and further details on module credits) are provided in the module handbook.

Section 7 Module B16 – Artificial Intelligence Seminar

(1) ¹In module B16 (Artificial intelligence seminar) worth 5 ECTS credits, students choose an advanced seminar accounting for 2 semester hours (2 SWS) from a catalog stipulated by the Degree Program Committee. ²The catalog of available advanced

seminar modules is published before the beginning of the semester in accordance with local practice.

(2) ¹The overriding learning outcome of the module Artificial intelligence seminar is for students to work independently to evaluate and gain a thorough understanding of the current state of research in a field of artificial intelligence of the student's own choice (in particular within the key research areas of biomedical imaging and sensing, health data science and medical engineering at the Department AIBE). ²The second learning outcome is aimed at promoting personal and social skills through preparing, reporting on and presenting a topic relating to the subject to a specialist audience in a manner tailored to the target group. ³Thirdly, the element of choice allows students to tailor their profile in view of their career plans. ⁴The specific learning outcome of the advanced seminar depends on the chosen advanced seminar and is stipulated in the catalog published by the Degree Program Committee and in the module handbook. ⁵The topic of the seminar may be chosen in preparation of the Bachelor's thesis and is intended to allow students to engage with the current state of research.

(3) ¹The type and scope of the examination depend on which advanced seminar is chosen. Details can be found in the module handbook. ²The examination achievement per module shall be an assessed task pursuant to Section 6 (3) **ABMPO/TF**.

Section 8 Module B17 – Artificial Intelligence Project

(1) ¹In module B17 (Artificial intelligence project), students choose a project module worth 10 ECTS credits from a catalog stipulated by the Degree Program Committee. ²The catalog of available modules is published each semester in accordance with local practice.

(2) ¹The overriding learning outcome of the module Artificial intelligence project is to allow students to explore an area of their own choice covered by the degree program in Artificial Intelligence (in particular within the key research areas of biomedical imaging and sensing, health data science and medical robotics at the Department AIBE) and acquire further skills and expertise in this area by working on complex issues within the context of research-oriented projects. ²A second learning outcome is aimed at promoting personal and social skills by giving students the task of independently finding subject-specific solutions to a research-oriented problem. ³Thirdly, the element of choice allows students to tailor their profile in view of their career plans. ⁴The projects are aimed at allowing students to specialize in an area of artificial intelligence of their choice. ⁵The specific learning outcome of the chosen project depends on the project. Details are available in the catalog announced by the Degree Program Committee and the module handbook.

(3) ¹The type and scope of the examination are dependent on the specific project. Details can be found in the module handbook. ²The examination achievement for the module consists of a practical achievement.

Section 9 Module Group B18 – Free Choice

(1) ¹In the Free Choice module group, students must select modules worth 10 ECTS credits from all modules offered by FAU. ²The learning outcome of this group of modules is to allow students to choose their own individual focus outside the area of artificial intelligence.

(2) English language courses up to and including level B1+ are excluded.

(3) The type and scope of the lectures and seminars and the examination are dependent on the skills for the chosen module according to the relevant **degree program and examination regulations** and the module handbook.

Section 10 Bachelor's Thesis

(1) Admission to the Bachelor's thesis shall be governed by Section 31 (3)(2) **ABMPO/TF**.

(2) ¹The Bachelor's thesis should cover an academic topic from the area of artificial intelligence and is aimed at teaching students to engage independently with tasks in this area. ²The Bachelor's thesis module accounts for a total of 15 ECTS credits, with 12 ECTS credits allocated to the written Bachelor's thesis and 3 ECTS credits to the oral examination. ³Requirements for the Bachelor's thesis module shall be such that it can be completed within five months.

(3) ¹As a rule, a member of the teaching staff employed at FAU as their main occupation pursuant to Section 53 (4) **BayHIG** who is a primary or secondary member of the Department AIBE will be responsible for assigning and supervising the Bachelor's thesis; Section 12 (1) **ABMPO/TF** applies. ²Full-time and part-time university lecturers in accordance with Section 19 (1) **BayHIG** employed as their main occupation at FAU in accordance with Section 53 (4) **BayHIG** and responsible for one of the modules included in the Bachelor's degree program in Artificial Intelligence are also entitled to assign and supervise Bachelor's theses. ³The Degree Program Committee can approve of exceptions in justified cases.

(4) ¹The supervisor is responsible for setting a date for the student to present the results (approx. 30 min) followed by a discussion (15 min) during an advanced seminar either during the final phase or after submission of the Bachelor's thesis, and will announce the date at least one week in advance. ²The presentation is graded pursuant to Section 18 (1) **ABMPO/TF**.

(5) In deviation from Section 31 (6) **AMBPO/TF**, the Bachelor's thesis shall be written in English. The presentation shall also be held in English.

Section 11 Evaluation of Achievements for the Bachelor's Degree Program

(1) All graded modules in the Bachelor's degree program pursuant to **Appendix 1** or **2** count towards the final grade and are weighted with a factor corresponding to the ECTS credits.

(2) ¹Notwithstanding Section 32 (2)(3) **ABMPO/TF**, failed attempts in elective modules in the Bachelor's degree program that are marked accordingly in the degree program structure will not be counted when changing to alternative modules and it is still possible for students to change modules even after failing three attempts at the previous module. ²In addition, in the event of a failure to pass, there is no obligation to repeat the failed examination within the legally stipulated period pursuant to Section 32 (1)(6) **ABMPO/TF**.

Part III: Final Provisions

Section 12 Legal Validity, Transitory Provisions

¹These degree program and examination regulations shall come into effect on October 1, 2024. ²They shall apply to all students who enter the Bachelor's degree program in Artificial Intelligence in winter semester 2024/2025 or later.

Appendix 1: Structure of the Bachelor's Degree Program in Artificial Intelligence – Full-time study

Module no.	Module name	SWS (semester hours)				Total ECTS credits	Distribution of workload per semester in ECTS credits						Type and scope of the examination	GOP
		L	T	P	S		1. Winter semester	2. Summer semester	3. Winter semester	4. Summer semester	5. Winter semester	6. Summer semester		
Core modules in computer science														
B1	Algorithms, programming, and data representation	4	2	2		10	10						EA: WE120 + CA: TA	•
B2	Data engineering	2	2			5		5					EA: WE90	•
B3	Applied programming	2	2			5		5					EA: O20 or LA (5 pages) and CA: TA	•
B4	Computational complexity	4	2			7.5			7.5				EA: WE90	
B5	Introduction to software engineering	2	2			5			5				EA: WE90	
Core modules in mathematics														
B6	Mathematics for data science 1	4	2 4*			10	10						EA: WE120 + CA: TA	•
B7	Mathematics for data science 2	4	2 4*			10		10					EA: WE120 + CA: TA	•
B8	Probability and stochastic processes	2	2			5				5			EA: WE60	
Core modules in artificial intelligence														
B9	Artificial intelligence perspectives	2	2			5	5						EA: W90 or O30 ²⁾	•
B10	Artificial intelligence fundamentals 1	2	2			5			5				EA: WE90	
B11	Logic and symbolic artificial intelligence	4	2			7.5			7.5				EA: WE60	
B12	Artificial intelligence fundamentals 2	4	4			10				10			EA: WE90	
B13	Ethics and philosophy of AI (advanced seminar)				2	5				5			EA: WE90	

B14	Application domain fundamentals pursuant to Section 5 ³⁾					20	5	5	5	5			EA: see Section 5 (3)	
B15	Artificial intelligence electives pursuant to Section 6 ³⁾					30					15	15	EA: see Section 6 (3)	
B16	Artificial intelligence seminar (ad- vanced seminar) pursuant to Section 7 ³⁾				2	5					5		EA: see Section 7 (3)	
B17	Artificial intelligence project pursuant to Section 8 ^{3) 4)}					10					10		EA: see Section 8 (3)	
B18	Free Choice pursuant to Section 9 ⁵⁾					10		5		5			CA: see Section 9 (3)	
B19	Bachelor's thesis	Thesis					15					12	EA: Written assignment and presentation with discussion (approx. 30+15 Min.) (80% + 20%)	
		Advanced semi- nar				2						3		
Total SWS and ECTS credits:			115–132			180	30	30	30	30	30	30		

* **NOTE:** The scope of the exercise is 4 SWS. A corresponding correction will be made by amending the statutes.

Key:

- ¹⁾ Depending on student's choice.
- ²⁾ The type and scope of the examination are published each semester in the relevant module handbook.
- ³⁾ Notwithstanding Section 32 (2)(3) **ABMPO/TF**, failed attempts will not be counted when changing to alternative modules and it is still possible for students to change modules even after failing three attempts at the previous module. In addition, in the event of a failure to pass, there is no obligation to repeat the failed examination within the legally stipulated period pursuant to Section 32 (1)(6) **ABMPO/TF**.
- ⁴⁾ The relationship between attendance time/SWS and own study time varies depending on the specific project.
- ⁵⁾ Free choice of modules offered at FAU with the exception of language courses in English up to and including B1+. The type and scope of teaching units and examinations depend on the specific manner in which the respective module is taught and are regulated by the applicable (degree program and) examination regulations and/or the module handbook.

Abbreviations:

- GOP: Grundlagen- und Orientierungsprüfung pursuant to Section 4. Modules available for choosing are marked.
- WE60/WE90/WE120: written examination lasting 60, 90 or 120 minutes.
- O20/O30 min: oral examination lasting 20 or 30 minutes.
- EA: graded examination achievement (see Section 7 (3)(7) **ABMPO/TF**).
- LA: laboratory achievement (see Section 7 (3) sentences 3 and 5 **AMBPO/TF** and module handbook).
- CA: ungraded course achievement (see Section 7 (3) sentence 8) **ABMPO/TF**.
- SWS: semester hours
- TA: tutorial achievement (see Section 7 (5) **ABMPO/TF**)

Appendix 2: Structure of the Bachelor's Degree Program in Artificial Intelligence – Part-time study

Module no.	Module name	SWS (semester hours)				Total ECTS credits	Distribution of workload per semester in ECTS credits												Type and scope of the examination	GOP
		L	T	P	S		1. WS	2. SS	3. WS	4. SS	5. WS	6. SS	7. WS	8. SS	9. WS	10. SS	11. WS	12. SS		
Core modules in computer science																				
B1	Algorithms, programming, and data representation	4	2	2		10	10												EA: WE120 + CA: TA	•
B2	Data engineering	2	2			5		5											EA: WE90	•
B3	Applied programming	2	2			5		5											EA: O20 or LA (5 pages) ¹⁾ and CA: TA	•
B4	Computational complexity	4	2			7.5					7.5								EA: WE90	
B5	Introduction to software engineering	2	2			5							5						EA: WE90	
Core modules in mathematics																				
B6	Mathematics for data science 1	4	2 4*			10			10										EA: WE120 + CA: TA	•
B7	Mathematics for data science 2	4	2 4*			10				10									EA: WE120 + CA: TA	•
B8	Probability and stochastic processes	2	2			5								5					EA: WE60	
Core modules in artificial intelligence																				
B9	Artificial intelligence perspectives	2	2			5	5												EA: W90 or O30 ²⁾	•
B10	Artificial intelligence fundamentals 1	2	2			5			5										EA: WE90	
B11	Logic and symbolic artificial intelligence	4	2			7.5					7.5								EA: WE60	
B12	Artificial intelligence fundamentals 2	4	4			10						10							EA: WE90	
B13	Ethics and philosophy of AI (advanced seminar)				2	5						5							EA: WE90	
B14	Application domain fundamentals pursuant to Section 5 ³⁾					20		5					5	5	5				EA: see Section 5 (3)	
B15	Artificial intelligence electives pursuant to Section 6 ³⁾					30							5	5	10	10			EA: see Section 6 (3)	
B16	Artificial intelligence seminar (advanced seminar) pursuant to Section 7 ³⁾					5											5		EA: see Section 7 (3)	

B17	Artificial intelligence project pursuant to Section 8 ^{3) 4)}						10										10		EA: see Section 8 (3)	
B18	Free Choice pursuant to Section 9 ⁵⁾						10				5						5		CA: see Section 9 (3)	
B19	Bachelor's the- sis	Thesis					15											12	EA: written thesis and presentation with discussion (approx. 30+15 min) (80 % + 20%)	
		Advanced seminar				2											3			
Total SWS and ECTS credits			115–132				180	15	15	15	15	15	15	15	15	15	15			

* **NOTE:** The scope of the exercise is 4 SWS. A corresponding correction will be made by amending the statutes.

Key:

- 1) Depending on student's choice.
- 2) The type and scope of the examination are published each semester in the relevant module handbook.
- 3) Notwithstanding Section 32 (2)(3) **ABMPO/TF**, failed attempts will not be counted when changing to alternative modules and it is still possible for students to change modules even after failing three attempts at the previous module. In addition, in the event of a failure to pass, there is no obligation to repeat the failed examination within the legally stipulated period pursuant to Section 32 (1)(6) **ABMPO/TF**.
- 4) The relationship between attendance time/SWS and own study time varies depending on the specific project.
- 5) Free choice of modules offered at FAU with the exception of language courses in English up to and including B1+. The type and scope of teaching units and examinations depend on the specific manner in which the respective module is taught and are regulated by the applicable (degree program and) examination regulations and/or the module handbook.

Abbreviations:

- GOP: Grundlagen- und Orientierungsprüfung pursuant to Section 4. Modules available for choosing are marked.
- WE60/WE90/WE120: written examination lasting 60, 90 or 120 minutes.
- O20/O30 min: oral examination lasting 20 or 30 minutes.
- EA: graded examination achievement (see Section 7 (3)(7) **ABMPO/TF**).
- LA: laboratory achievement (see Section 7 (3) sentences 3 and 5 **AMBPO/TF** and module handbook).
- CA: ungraded course achievement (see Section 7 (3) sentence 8) **ABMPO/TF**.
- SWS: semester hours
- TA: tutorial achievement (see Section 7 (5) **ABMPO/TF**)