

Assessment plan for the curriculum of the Bachelor's degree programme in Artificial Intelligence, 2025-2026

Programme director: Prof. Dr. J.P. Borst

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1. Vision on assessment

1. to provide students with a broad perspective on the field of AI, assessment includes items that require transfer of student knowledge and understanding to all specializations within the field of AI as specified in the learning outcomes
2. to provide students with implementation skills in addition to theoretical knowledge, assessment includes practical assignments on all specializations in the field of AI
3. to ensure students master all relevant skills for a course unit, grades are not dominated by one specific mode of assessment
4. to stimulate students' ability for critical reflection, assessment will include components for self and peer evaluation
5. to stimulate students to work in culturally diverse groups, assessment of group assignments will include collaboration criteria
6. to design teaching and assessment according to a learning pathway, course coordinators will jointly implement assessment strategies for subsequent courses within a learning pathway

2. Assessment guidelines

1. all courses need a minimum of two summative assessment activities
2. final tests or assessments that contribute substantially to the final grade are reviewed by a second examiner
3. for summative assessment counting 25% or less to the final grade, informal formative assessment activities can be used. For summative assessment counting more than 25% towards the final grade a formal formative assessment activity needs to be in place.
informal formative assessment = ad hoc Q and A or feedback during lectures and tutorials
formal formative assessment = a mock exam similar to the actual exam or feedback that is based on the actual grading tool in case of an assignment
4. how students can use supporting materials and supporting (AI) tools is explicitly stated for all graded assignments
5. in all courses where the use of supporting materials or supporting tools is prohibited, a supervised assessment item is included
6. for group work, part of the grade can be dedicated to criteria related to collaboration and organization within groups
7. for all self and peer assessment a valid grading rubric needs to be provided to students

3. Learning outcomes of the degree programme

Learning Outcome	
<i>At the end of the programme, the graduate demonstrates knowledge, understanding, and the ability to evaluate, analyse and interpret relevant data in the field of...</i>	
1	the symbolic approach to Artificial Intelligence, and has the ability to apply this.
2	the numerical, non-symbolic approach to Artificial Intelligence, and has the ability to apply this.
3	computational models of cognitive processes and has expertise in constructing and applying this.
4	autonomous systems and robotics and has the ability to apply this.
5	linguistics and language technology and has the ability to apply this.
6	knowledge and agent systems and has expertise in designing, implementing and applying these.
<i>At the end of the programme, the graduate has knowledge and understanding of...</i>	
7	the most important philosophical theories developed in the areas of artificial intelligence and cognition.
8	relevant theories developed in the area of empirical sciences, psychology, biology and physics and has experience applying and analysing results thereof.
<i>At the end of the programme, the graduate has relevant knowledge and ability...</i>	
9	to apply methods and techniques from mathematics and logic used in Artificial Intelligence.
10	to use algorithms, data structures and important programming languages used in Artificial Intelligence.
<i>At the end of the programme, the graduate has the ability...</i>	
11	on an academic level, to analyse problems, critically review scientific results and communicate about this both individually as well as in a group, both oral and in written form, also in a broader societal context.
12	to critically reflect on one's own working method and to recognize the need for continued learning on a high degree of autonomy, also in the context of a master or a specialist profession.

4. Overview of assessment methods, test moments for course units, and examiners

The abbreviations for the relevant assessment methods used in below table are the following:

- Written Exam (WE)
- Oral Exam (OR)
- Report (R)
- Presentation (P)
- Practical Work (PR)
- Assignment (AST)

Year	Period	Course	Course code	EC	Assessment method(s)	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. start (ST), mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
Mandatory Course Units									
1	1a	Introduction to Artificial Intelligence	WBAIo04-05	5	AST	Yes	CA, ET	N.A. Taatgen	S.K. Mehlhorn
1	1a	Introduction to Neuroscience	WBAIo74-05	5	WE, AST	No	MT, EW	L. Vortmann	M.K. van Vugt
1	1a-1b	Imperative Programming (for AI)	WBAIo03-05	5	WE, AST	Yes	CA, MT, EW	H.A. de Weerd	R.F. Cunha
1	1a-1b	Calculus for Artificial Intelligence	WBAIo48-05	5	WE	No	ST, MT, EW	R. Luppens	A.E. Sterk
1	1b	Autonomous Systems	WBAIo02-05	5	WE, AST	Yes	CA, EW	P.A. Vogt	M. Sabatelli
1	1b	Introduction to Logic	WBAIo12-05	5	WE	Yes	MT, EW	D. Grossi	L.C. Verbrugge
1	2a	Algorithms and Data Structures	WBAIo18-05	5	WE, AST	Yes	CA, EW	H.A. de Weerd	J.J. Schoeffers
1	2a	Cognitive Psychology	WBAIo21-05	5	WE, P, AST, R	Yes	CA, EW	F. Cnossen	S.K. Mehlhorn
1	2a	General Linguistics	WBAIo22-05	5	WE, AST	Yes	CA, EW	S.M. Jones	J.C. van Rij – Tange
1	2b	Fundamental Artificial Intelligence	WBAIo63-05	5	WE, AST	Yes	CA, EW	J.D. Dibangoye	M. Sabatelli
1	2b	Linear Algebra and Multivariable Calculus	WBAIo50-05	5	WE, AST, IT	Yes	CA, MT, EW	TBD	TBD
1	2b	Statistics	WBAIo49-05	5	WE, AST	Yes	CA, EW	H.A. de Weerd	M.K. van Vugt
2	1a	Knowledge and Agent Systems	WBAIo57-05	5	WE, PR	Yes	CA, EW	H.B. Verheij	L.C. Verbrugge
2	1a	Object-Oriented Programming (for AI)	WBAIo45-05	5	WE, PR, AST	No	CA, EW	M. Zullich	R.F. Cunha

Year	Period	Course	Course code	EC	Assessment method(s)	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. start (ST), mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
2	1a	Scientific Skills	WBAIo76-05	5	AST, R, P	Yes	CA, ET	S.K. Mehlhorn	L. Vortmann
2	1b	Architectures of Intelligence	WBAIo09-05	5	WE, AST	Yes	CA, EW	J.P. Borst	N.A. Taatgen
2	1b	Introduction to Machine Learning	WBAIo56-05	5	WE, AST	Yes	CA, EW	M.A. Valdenegro Toro	A.I. Sburlea
2	1b	Signals and Systems (for AI)	WBAIo16-05	5	WE, AST	Yes	CA, EW	J.D. Cardenas Cartagena	H.A. de Weerd
2	2a	Advanced Logic	WBAIo17-05	5	WE, AST	Yes	CA, EW	L.C. Verbrugge	J.D. Top
2	2a	Natural Language Processing	WBAIo59-05	5	WE, R, AST	No	CA, EW	T.M. Tashu	Y. Ziser
2	2a	Philosophy of AI and Cognition *	FI203AI	5	*	*	*	*	*
2	2b	Applied Machine Learning	WBAIo65-05	5	AST, PR, P, R	Yes	CA, ET	I.P. de Jong	M. Valdenegro-Toro
2	2b	Data Analytics and Communication	WBAIo11-05	5	WE, AST, PR	Yes	CA, EW	M.K. van Vugt	H.A. de Weerd
2	2b	Ethics in Artificial Intelligence	WBAIo40-05	5	WE, P	Yes	CA, EW	Z.L. Christoff	L.C. Verbrugge
3	2a-2b (1a-1b)	Bachelor's Project	WBAIo901-15	15	R	No	ET	Project Supervisors **	
Practical Course Units (10 ECTS mandatory)									
3	1a	Agent Technology Practical	WBAIo46-05	5	R, P, AST	Yes	CA, ET	J.D. Top	H.A. de Weerd
3	1a	Cognitive Modelling Practical	WBAIo20-05	5	R, P, AST, PR	Yes	CA, ET	J.P. Borst	S.K. Mehlhorn
3	1a-1b	AI Engineering Practical	WBAIo80-10	10	R, P	Yes	CA, ET	M.B. Schippers	J.D. Cardenas Cartagena
3	1b	Knowledge Technology practical	WBAIo14-05	5	R, P, AST	No	CA, ET	H.B. Verheij	L.C. Verbrugge
3	1b	Language Technology Practical	WBAIo27-05	5	R, PR, AST, P	No	CA, ET	T.M. Tashu	Y. Ziser
3	1b	Reinforcement Learning Practical	WBAIo15-05	5	R, P, AST	No	CA, ET	M. Sabatelli	J.D. Dibangoye
3	2a	Computational Methods in Neuroscience Practical	WBAIo77-05	5	AST, P	No	CA	L. Vortmann	C.L. Sibert
3	2a	Social Robotics Practical	WBAIo62-05	5	AST, R, P	Yes	CA, ET	P.A. de Vogt	S.H. Mohades Kasaei
3	2b	Interaction Design Practical	WBAIo75-05	5	R, P, AST	No	ET	M.B. Schippers	F. Cnossen
3	2b	Robotics Practical	WBAIo66-05	5	AST	Yes	CA	R. Carloni	P.A. Vogt
Elective Course Units (organized by Own Degree Programme)									
3	1a	Computational Modelling of the Brain	WBAIo79-05	5	WE, AST	Yes	CA, ET	C.L. Sibert	J.P. Borst

Year	Period	Course	Course code	EC	Assessment method(s)	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. start (ST), mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
3	1a	Introduction to Robotics	WBAIo67-05	5	AST	Yes	CA	R. Carloni	S.H. Mohades Kasaei
3	1a	Large Language Models	WBAIo68-05	5	R, P, PR, AST	No	CA, ET	T.M. Tashu	Y. Ziser
3	1a	Neural Networks	WBAIo28-05	5	WE, AST PR	Yes	CA, EW	I.P. de Jong	M. Sabatelli
3	1a	Reinforcement Learning	WBAIo61-05	5	WE, AST	Yes	CA, EW	R.F. Cunha	M. Sabatelli
3	1b	Hybrid Intelligence	WBAIo69-05	5	R, AST	Yes	CA, ET	H.A. de Weerd	J.J. Schoeffer
3	1b	Neural Computation	WBAIo78-05	5	WE, OR, AST	Yes	CA, EW	M.M. Cook	J.P. Borst
3	1b	Social Robotics	WBAIo71-05	5	AST, R, P	Yes	CA, ET	P.A. Vogt	S.H. Mohades Kasaei
3	2a	Human Language Learning	WBAIo72-05	5	WE, AST	Yes	CA, EW	J.C. van Rij-Tange	S.M. Jones
3	2b	Human Factors	WBAIo55-05	5	R, AST	Yes	CA, ET	C.L. Sibert	F. Cnossen
3	2b	Structural Analysis of Language for Cognitive Modelling	WBAIo52-05	5	AST	Yes	CA	S.M. Jones	J.C. van Rij-Tange
3	2b	Uncertainty in Machine Learning	WBAIo54-05	5	WE, AST	No	CA, EW	M.A. Valdenegro Toro	I.P. de Jong
Pre-approved Elective Course Units (organized by <u>Other</u> Degree Programme) *									
3	1a	Advanced Algorithms	WBCSo52-05	5	*	*	*	*	*
3	1a	Advanced Programming	WBCSo53-05	5	*	*	*	*	*
3	1a	Computational Complexity	WBCSo44-05	5	*	*	*	*	*
3	1a	Computer Graphics	WBCSo19-05	5	*	*	*	*	*
3	1a	C++ Fundamentals	WBCSo33-05	5	*	*	*	*	*
3	1a	Philosophy of Mind: Body, Brain, Mind	FI202LBG	5	*	*	*	*	*
3	1a	Thinking and deciding	PSB3E-CP08	5	*	*	*	*	*
3	1b	Conversational Interfaces	LIX029Bo5	5	*	*	*	*	*
3	1b	Introduction to Science Education	WBEC002-05	5	*	*	*	*	*
3	1b	IT Law for non-law students	RGARI70210	10	*	*	*	*	*
3	1b	Logic Programming	LIX003Bo5	5	*	*	*	*	*
3	1b	Programming in C++	WBCSo34-05	5	*	*	*	*	*
3	1b	Web Engineering	WBCSo08-05	5	*	*	*	*	*
3	2a	Computational Grammar	LIX025Bo5	5	*	*	*	*	*
3	2a1a	Information Security	WBCSo04-05	5	*	*	*	*	*
3	2a	Learning and memory	PSB3E-CP09	5	*	*	*	*	*

Year	Period	Course	Course code	EC	Assessment method(s)	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. start (ST), mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
3	2a	Machine Translation	LIX032B05	5	*	*	*	*	*
3	2b	Languages and Machines	WBCS027-05	5	*	*	*	*	*

* Mandatory Course Unit or Pre-Approved Electives organized by other Degree Programme. For more information see the Assessment Plan of the Degree Programme organizing the course unit.

** The following examiners are allowed to supervise Bachelor's projects in the Artificial Intelligence Bachelor's Programme:

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- prof. dr. J.P. Borst
- J.D. Cardenas Cartagena, MSc.
- prof. dr. R. Carloni
- dr. Z.L. Christoff
- dr. F. Cnossen
- prof. dr. M.M. Cook
- R.F. Cunha, MSc.
- dr. M.A. Dhali
- prof. dr. J. Dibangoye
- prof. dr. D. Grossi
- prof. dr. H. Jaeger
- dr. S.M. Jones
- I.P. de Jong, MSc
- dr. S.K. Mehlhorn
- dr. S.H. Mohades Kasaei
- dr. J.C. van Rij – Tange
- dr. M. Sabatelli
- dr. A.I. Sburlea
- dr. M.B. Schippers
- dr. J.J. Schoeffe
- dr. C.L. Sibert
- prof. dr. N.A. Taatgen
- dr. T.M. Tashu
- dr. S.D. Tokaç
- J.D. Top, MSc.
- dr. M.A. Valdenegro Toro
- prof. dr. L.C. Verbrugge
- prof. dr. H.B. Verheij
- dr. P.A. Vogt
- dr. L.M. Vortmann

- dr. M.K. van Vugt
- dr. H.A. de Weerd
- dr. Y. Ziser

5. Relationship between course units and details of the learning outcomes

Please note in the table below the course units per block in the programme. Indicate which learning outcomes are assessed in which courses by adding an X in the relevant cell. **An X means that the learning outcome is explicitly assessed (not merely addressed) in the course.**

			Learning outcomes of the degree programme											
			1	2	3	4	5	6	7	8	9	10	11	12
Period	Course	Course code	Year 1 – compulsory courses											
1a	Introduction to Artificial Intelligence	WBAIo04-05	X	X			X		X	X	X		X	X
1a	Introduction to Neuroscience	WBAIo74-05			X				X	X				X
1a-1b	Calculus for Artificial Intelligence	WBAIo48-05									X			
1a-1b	Imperative Programming (for AI)	WBAIo03-05										X		
1b	Autonomous Systems	WBAIo02-05				X							X	
1b	Introduction to Logic	WBAIo12-05	X					X			X			
2a	Algorithms and Data Structures	WBAIo18-05										X		
2a	Cognitive Psychology	WBAIo21-05								X			X	
2a	General Linguistics	WBAIo22-05	X				X							
2b	Fundamental Artificial Intelligence	WBAIo63-05	X											
2b	Linear Algebra and Multivariable Calculus	WBAIo50-05									X			
2b	Statistics	WBAIo49-05									X		X	
Period	Course	Course code	Year 2 compulsory courses											
1a	Knowledge and Agent Systems	WBAIo57-05	X					X				X		
1a	Object-Oriented Programming (for AI)	WBAIo45-05										X		
1a	Scientific Skills	WBAIo76-05			X					X		X	X	X
1b	Architectures of Intelligence	WBAIo09-05	X		X					X			X	
1b	Introduction to Machine Learning	WBAIo56-05		X							X	X		
1b	Signals and Systems	WBAIo16-05				X					X	X	X	X
2a	Advanced Logic	WBAIo17-05	X								X			
2a	Natural Language Processing	WBAIo59-05					X				X		X	
2a	Philosophy of AI and Cognition	FI203AI							X					
2b	Applied Machine Learning	WBAIo65-05		X								X	X	X
2b	Data Analytics and Communication	WBAIo11-05		X						X			X	
2b	Ethics in Artificial Intelligence	WBAIo40-05							X				X	X
Period	Course	Course code												

			Learning outcomes of the degree programme											
			1	2	3	4	5	6	7	8	9	10	11	12
			Year 3 compulsory courses											
2a-2b (1a-1b)	Bachelor's Project	WBAI901-15	*	*	*	*	*	*	*	*	*	*	X	X
Period	Course	Course code	Practicals											
1a	Agent Technology Practical	WBAI046-05	X			X		X		X		X	X	
1a	Cognitive Modelling Practical	WBAI020-05	X		X					X			X	X
1a-1b	AI Engineering Practical	WBAI080-10		X							X	X	X	X
1b	Knowledge Technology practical	WBAI014-05	X					X				X		X
1b	Language Technology Practical	WBAI027-05									X			
1b	Reinforcement Learning Practical	WBAI015-05		X						X			X	
2a	Computational Methods in Neuroscience Practical	WBAI077-05			X					X		X	X	X
2a	Social Robotics Practical	WBAI062-05				X						X	X	
2b	Interaction Design Practical	WBAI075-05											X	X
2b	Robotics Practical	WBAI066-05				X				X		X	X	X
Period	Course	Course code	Electives (organized by Own Degree Programme)											
1a	Computational Modelling of the Brain	WBAI079-05	X	X	X				X		X		X	
1a	Introduction to Robotics	WBAI067-05				X				X		X	X	X
1a	Large Language Models	WBAI068-05					X		X		X	X	X	
1a	Neural Networks	WBAI028-05		X					X	X	X	X		
1a	Reinforcement Learning	WBAI061-05		X		X		X				X	X	X
1b	Hybrid Intelligence	WBAI069-05	X	X	X			X	X			X	X	
1b	Neural Computation	WBAI078-05		X	X					X				
1b	Social Robotics	WBAI071-05				X				X			X	
2a	Human Language Learning	WBAI072-05					X			X				
2b	Human Factors	WBAI055-05						X	X	X				X
2b	Structural Analysis of Language for Cognitive Modelling	WBAI052-05					X							
2b	Uncertainty in Machine Learning	WBAI054-05		X					X		X	X		
Period	Course	Course code	Pre-approved Electives (organized by <u>Other</u> Degree Programme)											
1a	Advanced Algorithms	WBCS052-05										X		
1a	Advanced Programming	WBCS053-05										X	X	

			Learning outcomes of the degree programme											
			1	2	3	4	5	6	7	8	9	10	11	12
1a	C++ Fundamentals	WBCS033-05										X		
1a	Computer Graphics	WBCS019-05									X	X		
1a	Computational Complexity	WBCS044-05	X								X			
1a	Philosophy of Mind: Body, Brain, Mind	FI202LBG							X	X				
1a	Thinking and deciding	PSB3E-CP08								X			X	X
1b	Conversational Interfaces	LIX029B05					X					X		
1b	Introduction to Science Education	WBEC002-05											X	
1b	IT Law for non-law students	RGARI70210											X	
1b	Logic Programming	LIX003B05	X					X			X	X		
1b	Programming in C++	WBCS034-05										X		
1b	Web Engineering	WBCS008-05										X	X	
2a	Computational Grammar	LIX025B05					X				X			
2a	Information Security	WBCS004-05										X		
2a	Learning and memory	PSB3E-CP09			X				X					
2a	Machine Translation	LIX032B05					X						X	
2b	Languages and Machines	WBCS027-05	X				X	X			X			

* The learning outcomes in the Bachelor's Project differ depending on the type of project.