

Assessment plan for the curriculum of the Master'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 stimulate students to develop strong academic skills in addition to mastery of content, assessment will include the diversity of skills relevant to a professional in AI, which each have a substantial contribution to the final grade
2. to prepare students for their future careers, authentic assessment, geared towards future work, will be implemented where possible
3. to stimulate students' ability for critical reflection, assessment will include components for self and peer evaluation
4. 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 master graduate ...</i>	
1	demonstrates knowledge, understanding and the ability to evaluate, analyse and interpret relevant data, all on a level that builds on and surpasses the level of the bachelor Artificial Intelligence, in at least five (four, for the master graduate in Artificial Intelligence track Science, Business and Policy) of the research areas below. In one research area of Artificial Intelligence the master has specialised knowledge at an advanced level. a. The symbolic approach to Artificial Intelligence b. The numerical, non-symbolic approach to Artificial Intelligence c. Computational theories of perception and cognition d. Agent systems e. Linguistics and language technology f. Autonomous systems and robotics g. Machine learning and pattern recognition
2	(except for the master graduate in track Science, Business and Policy) demonstrates knowledge and understanding, on a level that builds on and surpasses the level of the bachelor Artificial Intelligence, in the empirical sciences (Psychology, Biology and Physics) and has experience applying and analysing results thereof.
3	demonstrates relevant knowledge and the ability to apply methods and techniques from mathematics and logic used in Artificial Intelligence.
4	demonstrates relevant knowledge and the ability to use algorithms, data structures and important programming languages used in Artificial Intelligence.
5	has the ability to, on an international academic level, analyse problems, critically and constructively review both one's own and other scientific results, even if incomplete, and communicate about this both individually as in a group, both oral and in written form, also in a broader societal context, to both specialists and non-specialists.
6	has the ability to critically reflect on their own working method and knowledge and to recognize the need for continued learning on a high degree of autonomy, and is able to understand the scientific developments within the field of Artificial Intelligence.
Additionally, the master graduate in Artificial Intelligence in the track Science, Business and Policy ...	
7	has an understanding of the way in which businesses and policy organizations are functioning (governments and non-governmental organizations, NGO's).
8	understands the connections between natural science research, business, and policy.
9	is able to integrate aspects of natural science, business and management.
10	has developed their social and communicative skills, is able to work project-based, and is capable of taking professional responsibility.

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

This table shows all the course units for each year of the programme and assessment methods.

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)
- Peer Review (PRW)

Year	Period	Course	Course code	EC	Assessment methods	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
Mandatory Course Units									
1	1a	Responsible AI	WMAIo29-05	5	WE, AST	Yes	CA, EW	H.B. Verheij	L.C. Verbrugge
1	1a	Design of Multi-Agent Systems	WMAIo04-05	5	R, P, PRW	Yes	MT, ET	H.A. de Weerd	H.B. Verheij
1	1a	Advanced Machine Learning	WMAIo30-05	5	WE, AST, R	No	CA, EW	J.S. Dibangoye	M. Sabatelli
1	1b	Deep Learning	WMAIo17-05	5	WE, AST	No	CA, EW	M.A. Valdenegro Toro	M. Sabatelli
1	2a	Methodology in Artificial Intelligence	WMAIo26-05	5	P, R, AST	Yes	CA, MT, ET	M.A. Valdenegro Toro	J.S. Dibangoye
1	2b	Natural Language Processing with Deep Learning	WMAIo31-05	5	WE, R, PR, AST	No	CA, EW	Y. Ziser	T.M. Tashu
2	1a-2b	Final Research Project AI ¹	WMAIo01-45	45	R, P	No	ET	Project supervisor **	Project supervisor **
2	1a	Introduction Science and Business ²	WMSEo01-10	10	*	*	*	*	*
2	1a-1b	Introduction Science and Policy ²	WMSEo02-10	10	*	*	*	*	*
2	1b-2b	Work Placement Business and Policy ²	WMSE902-40	40	*	*	*	*	*
2	2a-2b	Research Project AI for SBP ²	WMAIo39-15	15	R, P	No	ET	Project Supervisor **	Project Supervisor **
Course Units in Specialisation(s) and Pre-approved Electives (organized by Own Degree Programme)									
2	1a	Arguing Agents	WMAIo01-05	5	WE	No	EW	H.B. Verheij	L.C. Verbrugge
1, 2	1a-2b	Artificial Intelligence Challenges ¹	WMAIo40-10	10	R	No	ET	Project Supervisor**	Project Supervisor**
2	1a	Control Methods for Robotics	WMAIo37-05	5	R, P	Yes	MT, ET	R. Carloni	S.H. Mohades Kasaei

Year	Period	Course	Course code	EC	Assessment methods	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
2	1a	Multi-agent Reinforcement Learning	WMAIo33-05	5	WE, AST, R	Yes	CA, EW	J.S. Dibangoye	R.F. Cunha
1, 2	1b	Advanced Hybrid Intelligence	WMAIo36-05	5	R, P	Yes	CA, ET	H.A. de Weerd	J.J. Schoeffe
1, 2	1b	Cognitive Robotics	WMAIo03-05	5	R, P, PR, AST	No	CA, ET	S.H. Mohades Kasaei	R. Carloni
1, 2	1b	Computational Social Choice	WMAIo16-05	5	R, AST	No	CA, ET	D. Grossi	L.C. Verbrugge
1, 2	1b	Logical Aspects of Multi-agent Systems	WMAIo20-05	5	AST, PR, P	Yes	CA	L.C. Verbrugge	J.D. Top
1, 2	1b	Pattern Recognition (for AI)	WMAIo21-05	5	WE, R, AST	Yes	CA, EW	M.A. Dhali	S.H. Mohades Kasaei
1, 2	2a	Collective Intelligence	WMAIo23-05	5	WE, AST	Yes	CA, EW	Z.L. Christoff	L.C. Verbrugge
1, 2	2a	Computational Game Theory	WMAIo35-05	5	R, AST	No	CA, ET	D. Grossi	H.A. de Weerd
1, 2	2a	Neuroprosthetics	WMAIo28-05	5	AST	Yes	ET	A.I. Sburlea	R. Carloni
1, 2	2a	Robotics for AI	WMAIo11-05	5	R, PR	Yes	CA, ET	R. Carloni	S.H. Mohades Kasaei
1, 2	2a	Trustworthy and Explainable AI	WMAIo32-05	5	WE, P, PR	No	CA, EW	J.J. Schoeffe	M.A. Valdenegro Toro
1, 2	2b	Deep Learning Practical	WMAIo34-05	5	R, P, PR	Yes	CA	M.A. Dhali	M.A. Valdenegro Toro
1, 2	2b	Deep Reinforcement Learning	WMAIo24-05	5	WE, R, P	Yes	EW	M. Sabatelli	J.S. Dibangoye
1, 2	2b	Human-Robot Interaction for Social Robots	WMAIo27-05	5	R, P, AST	Yes	CA, ET	P.A. Vogt	R. Carloni
Pre-approved Electives (organized by <u>Other</u> Degree Programme) ^{*, 1}									
2	1a-1b	Advanced Statistical Modelling	WMCC005-05	5	*	*	*	*	*
2	1a	Advanced Topics in Security and Privacy	WMCS001-05	5	*	*	*	*	*
2	1a	Cloud Computing and Cloud-Based Applications	WMCS032-05	5	*	*	*	*	*
2	1a	Human-Centred Artificial Intelligence	WMCC023-05	5	*	*	*	*	*
2	1a	Introduction to Data Science	WMCS002-05	5	*	*	*	*	*
2	1a	Models and Semantics of Computation	WMCS026-05	5	*	*	*	*	*
2	1a	Perception for Visual Computing	WMCS029-05	5	*	*	*	*	*
2	1a	Psycholinguistics and Cognition	WMCC020-05	5	*	*	*	*	*
2	1a	Robotics for IEM	WMIE005-05	5	*	*	*	*	*
2	1a	Robotics State Estimation	WMCS040-05	5	*	*	*	*	*
2	1a	Semantic Web Technology	LIX002M05	10	*	*	*	*	*
2	1a, 2a	Skills in Science Communication	WMEC006-05	5	*	*	*	*	*

Year	Period	Course	Course code	EC	Assessment methods	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. mid-term (MT), end-term (ET), continuous assessment (CA), exam week (EW), etc)	First examiner	Second examiner
2	1a	Social Network Analysis	WMCS028-05	5	*	*	*	*	*
2	1a	User Modelling	WMCC021-05	5	*	*	*	*	*
1, 2	1b	Cognitive Modelling	WMCC019-05	5	*	*	*	*	*
1, 2	1b	Computational Semantics	LIX021M05	5	*	*	*	*	*
1, 2	1b	Ethical Hacking	WMCS030-05	5	*	*	*	*	*
1, 2	1b, 2b	Intelligent Mobile Perception in Practice	WMCS042-05	5	*	*	*	*	*
1, 2	1b	Machine Learning Systems Deployment and Operations	WMCS039-05	5	*	*	*	*	*
1, 2	1b	Modal Logic and Proof Theory	WMCS027-05	5	*	*	*	*	*
1, 2	1b	Scientific Visualization	WMCS018-05	5	*	*	*	*	*
1, 2	2a	Advanced Topics in Natural Language Processing	LIX006M05	5	*	*	*	*	*
1, 2	2a	AI in Education	WMCC028-05	5	*	*	*	*	*
1, 2	2a	Cognitive Engineering	WMCC001-05	5	*	*	*	*	*
1, 2	2a	Computational Simulations of Language	WMCC009-05	5	*	*	*	*	*
1, 2	2a	Computer Vision	WMCS015-05	5	*	*	*	*	*
1, 2	2a	Multimodal Mobile Sensing	WMCS041-05	5	*	*	*	*	*
1, 2	2a	Non-Invasive Brain-Computer Interfaces	WMCC016-05	5	*	*	*	*	*
1, 2	2a	Scalable Computing	WMCS017-05	5	*	*	*	*	*
1, 2	2b	Cognitive Neural Networks	WMCC022-05	5	*	*	*	*	*
1, 2	2b	Computational Cognitive Neuroscience	WMCC010-05	5	*	*	*	*	*
1, 2	2b	Language Technology Project	LIX025M05	5	*	*	*	*	*
1, 2	2b	Models of Human-Syntax Processing	WMCC014-05	5	*	*	*	*	*
1, 2	2b	Neuro-ergonomics	WMCC011-05	5	*	*	*	*	*
1, 2	2b	Neuromorphic Circuit Design	WMPH044-05	5	*	*	*	*	*
1, 2	2b	User-Centred Design	WMCC025-05	5	*	*	*	*	*

1 Not applicable for students in SBP track

2 Only applicable for students in SBP track

* 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 Final Research projects in the Artificial Intelligence Master's Programme:

- 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. Schoeffter
- 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. M. Zullich

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									
			(7-10 only applicable for SBP track)									
			1	2	3	4	5	6	7	8	9	10
Period	Course	Course code	Year 1 - compulsory courses									
1a	Responsible AI	WMAI029-05	X				X	X				
1a	Design of Multi-Agent Systems	WMAI004-05	d			X	X					X
1a	Advanced Machine Learning	WMAI030-05	a, b, g	X	X	X	X	X				
1b	Deep Learning	WMAI017-05	b, g		X	X	X					
2a	Methodology in Artificial Intelligence	WMAI026-05	X		X	X	X	X		X		X
2b	Natural Language Processing with Deep Learning	WMAI031-05	e			X		X				
Period	Course	Course code	Year 2 - compulsory courses									
1a-2b	Final Research Project AI ¹	WMAI901-45		X	X	X	X	X				
1a	Introduction Science and Business ²	WMSE001-10					X	X	X	X		X
1a-1b	Introduction Science and Policy ²	WMSE002-10					X	X	X	X		X
1b-2b	Work Placement Business and Policy ²	WMSE902-40					X	X			X	X
2a-2b	Research Project AI for SBP ²	WMAI039-15					X	X			X	X
Period	Course	Course code	Course Units in Specialisation(s) and Pre-approved Electives (organized by Own Degree Programme)									
1a	Arguing Agents	WMAI001-05	a, b, d		X							
1a-2b	Artificial Intelligence Challenges ¹	WMAI040-10	a, b, d, e, f, g		X	X	X	X				
1a	Control Methods for Robotics	WMAI037-05	f			X	X	X				
1a	Multi-agent Reinforcement Learning	WMAI033-05	a, b, c, d, f, g	X	X	X	X	X				
1b	Advanced Hybrid Intelligence	WMAI036-05	a, b, c, d				X	X				
1b	Cognitive Robotics	WMAI003-05	b, c, f, g	X	X	X	X	X				
1b	Computational Social Choice	WMAI016-05	a, d	X	X		X	X				
1b	Logical Aspects of Multi-agent Systems	WMAI020-05	a, d		X	X	X					
1b	Pattern Recognition (for AI)	WMAI021-05	f, g			X	X					
2a	Collective Intelligence	WMAI023-05	a, d		X		X	X	X			

			Learning outcomes of the degree programme										
			(7-10 only applicable for SBP track)										
			1	2	3	4	5	6	7	8	9	10	
2a	Computational Game Theory	WMAIo35-05	a, d	X	X		X						
2a	Neuroprosthetics	WMAIo28-05	f, g	X		X							
2a	Robotics for AI	WMAIo11-05	f			X	X	X					
2a	Trustworthy and Explainable AI	WMAIo32-05	g			X	X	X					
2b	Deep Learning Practical	WMAIo34-05	b, f, g		X	X	X						
2b	Deep Reinforcement Learning	WMAIo24-05	b, g		X	X	X	X					
2b	Human-Robot Interaction for Social Robots	WMAIo27-05	f	X			X						
Period	Course	Course code	Pre-approved Electives (organized by <u>Other</u> Degree Programme) ¹										
1a-1b	Advanced Statistical Modelling	WMCCo05-05		X	X								
1a	Advanced Topics in Security and Privacy	WMCS001-05				X	X						
1a	Cloud Computing and Cloud-Based Applications	WMCS032-05				X							
1a	Human-Centred Artificial Intelligence	WMCCo23-05	c	X			X	X					
1a	Introduction to Data Science	WMCS002-05	b, g		X	X							
1a	Models and Semantics of Computation	WMCS026-05			X	X							
1a	Perception for Visual Computing	WMCS029-05	c	X		X	X						
1a	Psycholinguistics and Cognition	WMCCo20-05	e										
1a	Robotics for IEM	WMIEo05-05	b, f	X	X								
1a	Robotic State Estimation	WMCS040-05	f		X	X							
1a	Semantic Web Technology	LIXo02M05	a, e		X								
1a, 2a	Skills in Science Communication	WMECo06-05					X						
1a	Social Network Analysis	WMCS028-05	d	X									
1a	User Modelling	WMCCo21-05	c	X			X						
1b	Cognitive Modelling	WMCCo19-05	c	X									
1b	Computational Semantics	LIXo21M05	e			X							
1b	Ethical Hacking	WMCS030-05					X	X					
1b, 2b	Intelligent Mobile Perception in Practice	WMCS042-05	f			X	X						
1b	Machine Learning Systems Deployment and Operations	WMCS039-05	g			X							
1b	Modal Logic and Proof Theory	WMCS027-05			X								

			Learning outcomes of the degree programme									
			(7-10 only applicable for SBP track)									
			1	2	3	4	5	6	7	8	9	10
1b	Scientific Visualization	WMCS018-05			X	X						
2a	Advanced Topics in Natural Language Processing	LIX006M05	e			X						
2a	AI in Education	WMCC028-05	c	X			X					
2a	Cognitive Engineering	WMCC001-05	c	X			X					
2a	Computational Simulations of Language	WMCC009-05	e									
2a	Computer Vision	WMCS015-05	c		X							
2a	Multimodal Mobile Sensing	WMCS041-05	f			X						
2a	Non-Invasive Brain-Computer Interfaces	WMCC016-05	g		X							
2a	Scalable Computing	WMCS017-05	b			X						
2b	Cognitive Neural Networks	WMCC022-05	b	X		X						
2b	Computational Cognitive Neuroscience	WMCC010-05	c	X			X					
2b	Language Technology Project	LIX025M05	e				X					
2b	Models of Human-Syntax Processing	WMCC014-05	e									
2b	Neuro-ergonomics	WMCC011-05	a, c, d, f, g	X			X	X				
2b	Neuromorphic Circuit Design	WMPH044-05	b			X						
2b	User-Centred Design	WMCC025-05	c	X			X					

¹ Not applicable for students in SBP track

² Only applicable for students in SBP track

* The learning outcomes in projects can differ depending on the type of project.