Assessment plan for the curriculum of the Master's degree programme in Computational Cognitive Science, 2025-2026

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

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Submission date Faculty Board: 14 May 2025

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 computational cognitive science, 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 *At the end of the programme, the master graduate …*	
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 three of the research areas below. In one research area of Computational Cognitive Science the master has specialised knowledge at an advanced level. a. Computational theories and models of cognitive processes b. Multivariate statistics c. Cognitive ergonomics d. Application of formal models of cognition in human-computer interaction and education e. Linguistics and language technology f. Cognitive neuroscience
2	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 Computational Cognitive Science.
4	demonstrates relevant knowledge and the ability to use programming languages used in the field of Computational Cognitive Science.
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 to communicate about this both individually and in a group, both orally and in written form, also in a broader societal context, to both specialists and nonspecialists.
6	has the ability to critically reflect on their own working method and knowledge and to recognize the need for continued learning with a high degree of autonomy, and is able to understand the scientific developments within the field of Computational Cognitive Science.

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 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-1b	Advanced Statistical Modelling	WMCC005-05	5	WE, AST	Yes	CA, MT, EW	J.C. van Rij-Tange	J.P. Borst
1	1a	Human-Centred Artificial Intelligence	WMCC023-05	5	AST, WE	No	CA	F. Cnossen	J.J. Schoeffer
1	1a	Modelling of Human Language	WMCC018-05	5	AST	No	CA	S.D. Tokac	S.M. Jones
1	1a-1b	Methods in CCS	WMCC015-05	5	P, R	Yes	CA, ET	J.P Borst	L. Vortmann
1	1b	Cognitive Modelling	WMCC019-05	5	AST, R	Yes	CA, ET	N.A. Taatgen	H. van Rijn
1	1b	Machine Learning for Computational Cognitive Science	WMCC017-05	5	P, AST	No	CA, MT	A.I. Sburlea	M.A. Valdenegro-Toro
2	1a-2b	Final Research Project CCS	WMCC901-45	45	R, P	No	NA	Project Supervisor**	Project Supervisor**
Course Units in Specialisation(s) and Pre-approved Electives (organized by Own Degree Programme)									
1	1a-2b	First Year Project	WMCC027-15	15	R, P	No	ET	Project Supervisor**	Project Supervisor**
2	1a	User Modelling	WMCC021-05	5	AST, R	No	ET	C.L. Sibert	J.P. Borst
2	1a	Psycholinguistics and Cognition	WMCC020-05	5	AST,R, P	No	CA, ET	S.D. Tokac	J.C. van Rij-Tange
1, 2	2a	Advanced Analysis of Brain and Behavior	WMCC026-05	5	R, AST, P	No	CA, ET	L.M. Vortmann	A.I. Sburlea
1, 2	2a	AI in Education	WMCC028-05	5	R, AST, P	No	CA, ET	N.A. Taatgen	J.P. Borst
1, 2	2a	Cognitive Engineering	WMCC001-05	5	R, P, AST	Yes	CA	F. Cnossen	C.L. Sibert
1, 2	2a	Computational Simulations of Language	WMCC009-05	5	AST	Yes	CA	S.M. Jones	J.C. van Rij-Tange

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
1, 2	2a	Non-Invasive Brain Computer Interfaces	WMCC016-05	5	WE, AST, P	No	CA, EW	A.I. Sburlea	I.P. de Jong
1, 2	2b	Cognitive Neural Networks	WMCC022-05	5	WE, OR, AST	Yes	CA, EW	M.M. Cook	J.P. Borst
1, 2	2b	Computational Cognitive Neuroscience	WMCC010-05	5	R, AST, P	Yes	CA, ET	M.K. van Vugt	N.A. Taatgen
1, 2	2b	Models of Human-Syntax Processing	WMCC014-05	5	AST, R	Yes	CA, ET	S.M. Jones	J.C. van Rij-Tange
1, 2	2b	Neuro-ergonomics	WMCC011-05	5	R, P	Yes	CA, ET	E.G. Akyurek	J.P. Borst
1, 2	2b	User-Centred Design	WMCC025-05	5	R, P, PR	Yes	ET	M.B. Schippers	F. Cnossen
Pre-approved Electives (organized by <u>Other</u> Degree Programme) *									
2	1a	Advanced Machine Learning	WMAI030-05	5	*	*	*	*	*
2	1a	Arguing Agents	WMAI001-05	5	*	*	*	*	*
2	1a	Auditory and Visual Perception	WMBC002-05	5	*	*	*	*	*
2	1a	Control Methods for Robotics	WMAI037-05	5	*	*	*	*	*
2	1a	Design of Multi-Agent Systems	WMAI004-05	5	*	*	*	*	*
2	1a	Introduction Science and Business	WMSE001-10	10	*	*	*	*	*
2	1a-1b	Introduction Science and Policy	WMSE002-10	10	*	*	*	*	*
2	1a	Introduction to Data Science	WMCS002-05	5	*	*	*	*	*
2	1a	Scientific Visualization	WMCS018-05	5	*	*	*	*	*
2	1a	Semantic Web Technology	LIX002M05	10	*	*	*	*	*
1, 2	1a, 2a	Skills in Science Communication	WMEC006-05	5	*	*	*	*	*
2	1b	Advanced Hybrid Intelligence	WMAI036-05	5	*	*	*	*	*
2	1b	Cognitive Robotics	WMAI003-05	5	*	*	*	*	*
2	1b	Computational Semantics	LIX021M05	5	*	*	*	*	*
2	1b	Computational Social Choice	WMAI016-05	5	*	*	*	*	*
2	1b	Deep Learning	WMAI017-05	5	*	*	*	*	*
2	1b	Logical Aspects of Multi-agent Systems	WMAI020-05	5	*	*	*	*	*
2	1b	Pattern Recognition (for AI)	WMAI021-05	5	*	*	*	*	*
2	1b	Philosophy of Neuroscience	FI184FR	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
1, 2	2a	Advanced Topics in Natural Language Processing	LIX006M05	5	*	*	*	*	*
1, 2	2a	Collective Intelligence	WMAI023-05	5	*	*	*	*	*
1, 2	2a	Computational Game Theory	WMAI035-05	5	*	*	*	*	*
1, 2	2a	Corpus Linguistics	LTR024M05	5	*	*	*	*	*
1, 2	2a	Neuroprosthetics	WMAI028-05	5	*	*	*	*	*
1, 2	2a	Robotics for AI	WMAI011-05	5	*	*	*	*	*
1, 2	2a	Trustworthy and Explainable AI	WMAI032-05	5	*	*	*	*	*
1, 2	2b	Deep Learning Practical	WMAI034-05	5	*	*	*	*	*
1, 2	2b	Human-Robot Interaction for Social Robots	WMAI027-05	5	*	*	*	*	*
1, 2	2b	Language Technology Project	LIX025M05	5	*	*	*	*	*
1, 2	2b	Natural Language Processing with Deep Learning	WMAI031-05	5	*	*	*	*	*

* 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 First Year Projects and Final Research Projects in the Computational Cognitive Science 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. Schoeffer
- 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					
			1	**2**	**3**	**4**	**5**	**6**
Period	**Course**	**Course code**	**Year 1 - compulsory courses**					
1a-1b	Advanced Statistical Modelling	WMCC005-05	b		X		X	
1a	Human-Centred Artificial Intelligence	WMCC023-05	c, d	X			X	X
1a	Modelling of Human Language	WMCC018-05	a					X
1a-1b	Methods in CCS	WMCC015-05	f	X		X	X	X
1b	Cognitive Modelling	WMCC019-05	a	X		X	X	X
1b	Machine Learning for Computational Cognitive Science	WMCC017-05	g		X			X
Period	**Course**	**Course code**	**Year 2 - compulsory courses**					
1a-2b	Final Research Project CCS	WMCC901-45		X	X	X	X	X
Period	**Course**	**Course code**	**Course Units in Specialisation(s) and Pre-approved Electives (organized by own Degree Programme)**					
1a-2b	First Year Project	WMCC027-15		X	X	X	X	X
1a	User Modelling	WMCC021-05	a, d	X		X	X	X
1a	Psycholinguistics and Cognition	WMCC020-05	e					
2a	Advanced Analysis of Brain and Behavior	WMCC026-05	a, b, f	X		X	X	X
2a	AI in Education	WMCC028-05	a, d	X		X	X	X
2a	Cognitive Engineering	WMCC001-05	c, d	X			X	X
2a	Computational Simulations of Language	WMCC009-05	e					
2a	Non-Invasive Brain Computer Interfaces	WMCC016-05	g		X			
2b	Cognitive Neural Networks	WMCC022-05	a, f	X		X		
2b	Computational Cognitive Neuroscience	WMCC010-05	a, f	X			X	X
2b	Models of Human-Syntax Processing	WMCC014-05	e					
2b	Neuro-ergonomics	WMCC011-05	a, c, d, f	X			X	X
2b	User-Centred Design	WMCC025-05	c	X			X	X
Period	**Course**	**Course code**	**Pre-approved Electives (organized by Other Degree Programme)**					
1a	Advanced Machine Learning	WMAI030-05			X			

			Learning outcomes of the degree programme					
			1	**2**	**3**	**4**	**5**	**6**
1a	Arguing Agents	WMAI001-05	a		X	X	X	
1a	Auditory and Visual Perception	WMBC002-05	a, c, d, f				X	
1a	Control Methods for Robotics	WMAI037-05		X		X		
1a	Design of Multi-Agent Systems	WMAI004-05	a, e		X	X	X	
1a	Introduction Science and Business	WMSE001-10					X	
1a-1b	Introduction Science and Policy	WMSE002-10					X	
1a	Introduction to Data Science	WMCS002-05	a		X			
1a	Scientific Visualization	WMCS018-05			X			
1a	Semantic Web Technology	LIX002M05	a, e		X			
1a, 2a	Skills in Science Communication	WMEC006-05					X	
1b	Advanced Hybrid Intelligence	WMAI036-05	a, b	X	X		X	
1b	Cognitive Robotics	WMAI003-05				X		
1b	Computational Semantics	LIX021M05	e			X		
1b	Computational Social Choice	WMAI016-05	a		X	X	X	
1b	Deep Learning	WMAI017-05	g		X	X	X	
1b	Logical Aspects of Multi-agent Systems	WMAI020-05	a		X	X	X	
1b	Pattern Recognition (for AI)	WMAI021-05	b		X	X	X	
1b	Philosophy of Neuroscience	FI184FR	a, f				X	
2a	Advanced Topics in Natural Language Processing	LIX006M05	e			X		
2a	Collective Intelligence	WMAI023-05			X			
2a	Computational Game Theory	WMAI035-05	a		X		X	X
2a	Corpus Linguistics	LTR024M05	e		X			
2a	Neuroprosthetics	WMAI028-05	b, c	X		X		
2a	Robotics for AI	WMAI011-05	g			X		
2a	Trustworthy and Explainable AI	WMAI032-05	d				X	
2b	Deep Learning Practical	WMAI034-05	g		X	X	X	
2b	Human-Robot Interaction for Social Robots	WMAI027-05	d	X		X	X	
2b	Language Technology Project [b]	LIX025M05	e				X	
2b	Natural Language Processing with Deep Learning	WMAI031-05	e		X	X		