



Appendices for the Master's degree programme in Computational Cognitive Science 2026 – 2027

- I. Learning outcomes of the Master's degree programme
- II. Tracks/Specialisations
- III. Content of the degree programme
- IV. Electives
- V. Entry requirements and compulsory order
- VI. Admission to the degree programme
- VII. Pre-master programmes and Fast-Track programmes
- VIII. Transitional provisions
- IX. Additional requirements Open degree programmes



Appendix I. Learning outcomes of the degree programme (Art. 3.1)

1. The master graduate 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. The master graduate 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. The master graduate, except for the master graduate in track Science Business and Policy, demonstrates relevant knowledge and the ability to apply methods and techniques from mathematics and logic used in Computational Cognitive Science.
4. The master graduate demonstrates relevant knowledge and the ability to use programming languages used in the field of Computational Cognitive Science.
5. The master graduate 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. The master graduate 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.

Additionally, the master graduate in Computational Cognitive Science 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.



Appendix II. Tracks/Specialisations (Art. 3.6)

The Computational Cognitive Science MSc Programme offers two main options, described in detail in Appendix III and IV:

MSc CCS programme with specialisation

The Computational Cognitive Science MSc programme offers three specialisations in the regular programme:

- a) Human-Centred Artificial Intelligence
- b) Human Language Modelling
- c) Neuro-Cognitive Computing

MSc CCS programme with SBP track

Instead of the regular programme with a specialisation, the MSc Computational Cognitive Science programme offers a track in Science, Business and Policy (SBP), which combines a shortened CCS programme with a preparation for professions in a societal, political and/or commercial context.



Appendix III. Content of the degree programme (Art. 3.7.1)

- MSc Computational Cognitive Science programme with specialisation
- MSc Computational Cognitive Science programme with SBP track

MSc Computational Cognitive Science programme with specialisation

The MSc CCS with specialisation consists of:

- Mandatory course units (75 ECTS; Table 1).
- Specialisation course units (15 ECTS; Appendix IV, Table 3).
- Elective course units (30 ECTS; Appendix IV, Table 3 and 4).

Course details including entry requirements, modes of instruction, modes of assessment and examination are described in OCASYS.

Table 1. Mandatory course units

Course code	Course unit name	ECTS
WMCC005-05	Advanced Statistical Modelling	5
WMCC019-05	Cognitive Modelling	5
WMCC901-45	Final Research Project CCS	45
WMCC023-05	Human-Centred Artificial Intelligence	5
WMCC017-05	Machine Learning for Computational Cognitive Science	5
WMCC015-05	Methods in CCS	5
WMCC018-05	Modelling of Human Language	5

MSc Computational Cognitive Science programme with SBP track

The MSc CCS with SBP track consists of:

- Mandatory course units from the MSc Computational Cognitive Science programme and the SBP programme (45 ECTS and 60 ECTS, respectively; Table 2).
- Elective course units from the MSc Computational Cognitive Science programme (15 ECTS; Appendix IV, Table 5).

Course details including entry requirements, modes of instruction, modes of assessment and examination are described in OCASYS.

Table 2. Mandatory course units

Course code	Course unit name	ECTS
<i>Computational Cognitive Science Programme</i>		
WMCC005-05	Advanced Statistical Modelling	5
WMCC019-05	Cognitive Modelling	5
WMCC023-05	Human-Centred Artificial Intelligence	5
WMCC017-05	Machine Learning for Computational Cognitive Science	5
WMCC015-05	Methods in CCS	5
WMCC018-05	Modelling of Human Language	5
WMCC029-15	Research Project CCS for SBP	15
<i>SBP Programme</i>		
WMSE001-10	Introduction Science and Business	10



university of
 groningen

WMSE002-10	Introduction Science and Policy	10
WMSE902-40	Work Placement Business and Policy	40



Appendix IV. Electives (Art. 3.8.1)

- MSc Computational Cognitive Science with specialisation
- MSc Computational Cognitive Science with SBP track

MSc Computational Cognitive Science with specialisation

In addition to the mandatory programme, the programme consists of 15 ECTS specialisation courses and 30 ECTS elective courses.

The programme offers three specialisations, which constitute coherent sets of elective courses that cover a particular subfield of Computational Cognitive Science:

- Human-Centred Artificial Intelligence
 - Cognitive Engineering [WMCC001-05]
 - User-Centred Design [WMCC025-05]
 - User Modelling [WMCC021-05]
- Human Language Modelling
 - Computational Simulations of Language [WMCC009-05]
 - Language Technology Project [LIX025M05]
 - Models of Human-Syntax Processing [WMCC014-05]
- Neuro-Cognitive Computing
 - Cognitive Neural Networks [WMCC022-05]
 - Computational Cognitive Neuroscience [WMCC010-05]
 - Non-Invasive Brain-Computer Interfaces [WMCC016-05]

It is strongly advised to follow a complete 15 ECTS specialisation. However, students are also allowed to do an open specialisation consisting of 15 ECTS of self-selected courses *from Table 3 and 4 that are marked as part of a specialisation*.

In addition to the 15 ECTS specialisation, 30 ECTS worth of elective course units have to be completed. Electives can be chosen from the list of electives of the Computational Cognitive Science and Artificial Intelligence programme (Table 3), pre-approved electives of other programmes (Table 4), or free electives (electives that have not been pre-approved). Students must request formal approval from the Board of Examiners to include free electives.

Table 3. Elective course units from CCS & AI

Course code	Course unit name	Part of specialisation	ECTS
WMCC026-05	Advanced Analysis of Brain and Behaviour		5
WMAIo36-05	Advanced Hybrid Intelligence		5
WMAIo30-05	Advanced Machine Learning		5
WMCC028-05	AI in Education		5
WMAIo40-10	Artificial Intelligence Challenges ^a		10
WMAIo01-05	Arguing Agents		5
WMCC001-05	Cognitive Engineering	X	5
WMCC022-05	Cognitive Neural Networks	X	5
WMAIo03-05	Cognitive Robotics		5
WMAIo23-05	Collective Intelligence		5
WMCC010-05	Computational Cognitive Neuroscience	X	5
WMAIo35-05	Computational Game Theory		5



WMCC009-05	Computational Simulations of Language	X	5
WMAIo16-05	Computational Social Choice		5
WMAIo37-05	Control Methods for Robotics		5
WMAIo17-05	Deep Learning		5
WMAIo34-05	Deep Learning Practical		5
WMAIo04-05	Design of Multi-Agent Systems		5
WMCC027-15	First Year Project ^a		15
WMAIo43-05	Fundamental Proofs in AI		5
WMAIo27-05	Human-Robot Interaction for Social Robots		5
WMAIo42-05	Legal aspects of AI ^b		5
WMAIo20-05	Logical Aspects of Multi-Agent Systems		5
WMCC014-05	Models of Human-Syntax Processing	X	5
WMAIo33-05	Multi-agent Reinforcement Learning		5
WMAIo31-05	Natural Language Processing with Deep Learning		5
WMAIo28-05	Neuroprosthetics		5
WMCC016-05	Non-Invasive Brain-Computer Interfaces	X	5
WMCC030-05	Realtime Non-Invasive Brain-Computer Interfaces		5
WMAIo11-05	Robotics for AI		5
WMCC025-05	User-Centred Design	X	5
WMCC021-05	User Modelling	X	5

^a A student can take either Artificial Intelligence Challenges or First Year Project, and will only be awarded credit points for one of the two course units.

^b Students who completed the course WBAIo84-05 are not allowed to take this one.

Table 4. Pre-approved elective course units from other degree programmes

Course code	Course unit name	Part of specialisation	ECTS
LIX006M05	Advanced Topics in Natural Language Processing		5
WMBC002-05	Auditory and Visual Perception		5
LIX021M05	Computational Semantics		5
LTR024M05	Corpus Linguistics		5
WMCS002-05	Introduction to Data Science		5
LIX025M05	Language Technology Project	X	5
LIX001M05	Natural Language Processing		5
FI184FR	Philosophy of Neuroscience		5
WMCS018-05	Scientific Visualization		5
LIX002M05	Semantic Web Technology		5
WMEC006-05	Skills in Science Communication		5



MSc Computational Cognitive Science programme with SBP track

In addition to the mandatory programme, 15 ECTS worth of elective course units have to be completed. Electives must be chosen from the list of electives below (Table 5).

Table 5. Elective course units

Course code	Course unit name	ECTS
WMCC026-05	Advanced Analysis of Brain and Behaviour	5
WMCC028-05	AI in Education	5
WMCC001-05	Cognitive Engineering	5
WMCC022-05	Cognitive Neural Networks	5
WMCC010-05	Computational Cognitive Neuroscience	5
WMCC009-05	Computational Simulations of Language	5
WMAI042-05	Legal aspects of AI ^a	5
WMCC014-05	Models of Human-Syntax Processing	5
WMCC016-05	Non-Invasive Brain-Computer Interfaces	5
WMCC030-05	Realtime Non-Invasive Brain-Computer Interfaces	5
WMCC025-05	User-Centred Design	5
WMCC021-05	User Modelling	5

^a Students who completed the course WBAI084-05 are not allowed to take this course.



Appendix V. Entry requirements and compulsory order (Art. 4.4)

The examinations for the course units listed in Table 6 may not be taken before the examinations for the associated course units have been passed:

Table 6. Entry requirements

Course unit name and code	Entry requirements
Final Research Project [WMCC901-45]	At least 60 ECTS credit points from the master's programme Cognitive Modelling [WMCC019-05] Human-Centred AI [WMCC023-05] Methods in CCS [WMCC015-05] Modelling of Human Language [WMCC018-05]
User Modelling [WMCC021-05]	Cognitive Modelling [WMCC019-05] or Architectures of Intelligence [WBAI009-05] or Cognitive Neuroscience 2: Modelling the Mind [WMBC028-05]
Work Placement Business and Policy [WMSE902-40]	At least 45 ECTS from the master's programme Introduction Science and Business [WMSE001-10] Introduction Science and Policy [WMSE002-10]



Appendix VI. Admission to the degree programme (Art. 2.1A.1, 2.1A.2 2.1B.1)

Holders of a certificate from the following Bachelor's degree programmes (excluding a bachelor's degree from the Open University) are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Computational Cognitive Science on that basis:

- Artificial Intelligence (CROHO/RIO 56981 or 56945)
- Cognitive Science and Artificial Intelligence (CROHO/RIO 59338)
- Data Science and Artificial Intelligence (CROHO/RIO 50300)
- Information Science (CROHO/RIO 56842)

For holders of another Bachelor's degree in Artificial Intelligence, Psychology, Cognitive Science, Information Science, or other relevant programmes there is an individual admission procedure based on the content of the respective bachelor's programme and language skills. The Board of Admissions of Computational Cognitive Science will assess the application and decide whether the applicant has sufficient background to register for the programme.



Appendix VII. Pre-master programmes and Fast-Track programmes (Art. 2.3)

A. Pre-Master's programmes

1. FSE offers predetermined and individually determined Pre-Master's programmes of 20-50 ECTS (Table 7.1-7.3) for access to the MSc Computational Cognitive Science for students with another relevant Dutch degree. The Board of Admissions may decide to not accept admission. The pre-master's programmes are to be completed in the year before starting the MSc Computational Cognitive Science. Starting date for a pre-master programme is 1 September.

Please note that the pre-master programmes below are indications; prospective students must always contact the Academic Advisor before starting a pre-master programme.

a. Pre-master programme 1

Pre-master programme 1 (Table 7.1) is for students with a Bachelor's degree in Psychology from the University of Groningen (UG). The Admission Board may decide to include/exclude different courses on an individual basis.

Table 7.1 Pre-master programme 1

Course code	Course unit name	ECTS	Period
<i>Semester 1</i>			
WBAI003-05	Imperative Programming (for AI)	5	Ia-Ib
WBAI009-05	Architectures of Intelligence	5	Ib
<i>Semester 2</i>			
WBAI018-05	Algorithms and Data Structures	5	IIa
WBAI063-058	Fundamental Artificial Intelligence	5	IIb
Total		20	

b. Pre-master programme 2

Pre-master programme 2 (Table 7.2) is for students with a relevant Bachelor's degree from a Dutch University (e.g., Cognition, Language and Communication, Communicatie- en Informatiewetenschappen, or a degree in Brain Science). The Admission Board may decide to include/exclude different courses on an individual basis.

Table 7.2 Pre-master programme 2

Course code	Course unit name	ECTS	Period
<i>Semester 1</i>			
WBAI003-05	Imperative Programming (for AI)	5	Ia-Ib
WBAI074-05	Introduction to Neuroscience	5	Ia
WBAI009-05	Architectures of Intelligence	5	Ib
<i>Semester 2</i>			
WBAI018-05	Algorithms and Data Structures	5	IIa



WBAIo63-05	Fundamental Artificial Intelligence	5	Iib
WBAIo49-05	Statistics	5	Iib
Total		30	

c. Pre-master programme 3

Pre-master programme 3 (Table 7.3) is for students with a relevant HBO degree (e.g. Game design, Data Science & AI, CIT). The Admission Board may decide to include/exclude different courses on an individual basis.

Table 7.3 Pre-master programme 3

Course code	Course unit name	ECTS	Period
<i>Semester 1</i>			
WBAIo03-05	Imperative Programming (for AI)	5	Ia-Ib
WBAIo74-05	Introduction to Neuroscience	5	Ia
WBAIo76-05	Scientific Skills	5	Ia
WBAIo09-05	Architectures of Intelligence	5	Ib
<i>Semester 2</i>			
WBAIo18-05	Algorithms and Data Structures	5	Iia
WBAIo22-05 WBAIo59-05	General Linguistics OR Natural Language Processing	5	Iia Iia
FI203AI	Philosophy of AI and Cognition	5	Iia
WBAIo11-05	Data Analytics and Communication	5	Iib
WBAIo63-05	Fundamental Artificial Intelligence	5	Iib
WBAIo49-05	Statistics	5	Iib
Total		50	

2. For holders of a HBO diploma not listed above, or for holders of a Dutch or foreign degree not listed in Appendix VI, the Board of Admissions decides:
 - a. The content and student workload of a tailor-made Pre-Master's programme.
or
 - b. Admission is granted
or
 - c. Admission is not granted

B. Fast-Track programmes

The MSc degree programme does not offer Fast-Track programmes.



Appendix VIII. Transitional provisions (Art. 7.1)

For students who were registered in the programme before 2026-2027, the following transitional provisions apply. The provisions are listed in reverse-chronological order. General provisions are described through text. Course units that are a direct replacement for discontinued course units are listed in table format.

Students who have completed a discontinued course (Table 8.1-8.3) are excluded from taking the respective replacement course and can still count the discontinued course as part of their programme.

Any cases not listed in the Teaching and Examination Regulations, through either the current curriculum or the transitional provisions, are to be handled by the Board of Examiners.

Students who started in 2025-2026 or before:

Table 8.1

Discontinued course unit			Replacement course unit		
Course Code	Course Name	ECTS	Course Code	Course Name	ECTS
WMCC011-05	Neuro-ergonomics	5	NA		
WMCC020-05	Psycholinguistics and Cognition	5	NA		

Students who started in 2024-2025 or before:

Table 8.2

Discontinued course unit			Replacement course unit		
Course Code	Course Name	ECTS	Course Code	Course Name	ECTS
WMCC024-05	Applied Cognitive Modelling	5	WMCC028-05	AI in Education	5

Students who started in 2023-2024 or before:

Table 8.3

Discontinued course unit			Replacement course unit		
Course Code	Course Name	ECTS	Course Code	Course Name	ECTS
WMCC007-05	Applied Cognitive Engineering	5	WMCC025-05	User-Centred Design	5
WMCC006-05	Cognitive Modelling: Basic Principles and Methods	5	WMCC019-05	Cognitive Modelling	5
WMCC008-05	Cognitive Modelling: Complex Behaviour	5	WMCC024-05	Applied Cognitive Modelling	5
WMCC003-05	Language Modelling	5	WMCC020-05	Psycholinguistics and Cognition	5



WMCCo04-05	User Models	5	WMCCo21-05	User Modelling	5
------------	-------------	---	------------	----------------	---

From 24-25 onwards, Human-Centred AI [WMCCo23-05] and Modelling of Human Language [WMCCo18-05] are part of the mandatory programme. Students who started in 23-24 or before do not have to include these courses in their mandatory programme, provided they still obtain a total of 120 ECTS.

The discontinued course Formal Models of Cognition [WBCCo02-05] is accepted as a valid course for students who started in 23-24 or before. Students who have completed this course do not have to complete Human-Centred AI [WMCCo23-05] and Modelling of Human Language [WMCCo18-05] to start their Final Research Project.

Students who started in 23-24 can still opt to do an internship and a 30 ECTS Final Research Project, instead of doing a 45 ECTS Final Research Project.



Appendix IX. Additional requirements Open degree programmes (Art. 3.9.2)

Students wishing to pursue an open degree programme in Computational Cognitive Science may file a request with the Board of Examiners; an Open Degree Programme must always be approved in advance. The Board of Examiners will evaluate whether the proposed curriculum meets the learning outcomes of the Computational Cognitive Science programme. An Open Degree Programme in Computational Cognitive Science must include the mandatory courses described in Appendix III, Table 1.