Appendices Master's Degree Programme Human-Machine Communication 2019 - 2020

Appendix I Learning Outcomes of the Degree Programme (Article 3.1)

1. The master 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 Human-Machine Communication 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 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 demonstrates relevant knowledge and the ability to apply methods and techniques from mathematics and logic used in Human-Machine Communication.

4. The master demonstrates relevant knowledge and the ability to use programming languages used in the field of Human-Machine Communication.

5. The master 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 non-specialists.

6. The master has the ability to critically reflect on his/her 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 Human-Machine Communication.

Appendix II Specialisations of the Degree Programme (Article 3.5)

Students must choose one of the following specialisations:
a) specialisation Cognitive Modelling
b) specialisation Cognitive Engineering
c) specialisation Computational Cognitive Neuroscience
d) specialisation Cognitive Language Modelling

Appendix III Content of the Degree Programme (Article 3.6)

1. The **degree programme** consists of the following mandatory course units:

Mandatory Course Units (30 ECTS credit points) with a study load of 5 ECTS credit points, unless stated otherwise
Advanced Statistical Modelling [**WMAI18001**]
Cognitive Modelling: Basic Principles and Methods [**KIM.CMB11**]
First-Year Research Project (15 ECTS credit points) [**KIM.FYRP11**]
Formal Models of Cognition [**KIM.FMC11**]
Final Research Project (45 ECTS credit points)
Final Research Project (45 ECTS credit points) [**KIM.AFMC06**] ***or*** Final Research Project (30 ECTS credit points) [**KIM.AFMC30**] *and* Internship (15 ECTS credit points) [**KIM.STAHMC**]

2. In addition to having to take the fixed mandatory programme, students will also have to take the mandatory course units of one of the four programme **specialisations** as referred to in Appendix II. The different specialisations contain the following course units:

Cognitive Modelling

Mandatory Course Units (15 ECTS credit points) with a study load of 5 ECTS credit points, unless stated otherwise
Cognitive Modelling – Complex Behaviour [**KIM.CMC11**]
Computational Cognitive Neuroscience [**KIM.CCN11**]
User Models [**KIM.UM03**]

Cognitive Engineering

Mandatory Course Units (20 ECTS credit points) with a study load of 5 ECTS credit points, unless stated otherwise
Applied Cognitive Engineering [**WMAI19004**]
Cognitive Engineering [**KIM.CE11**]
Neuro-ergonomics [**KIM.NE06**]
User Models [**KIM.UM03**]

Computational Cognitive Neuroscience

Mandatory Course Units (15 ECTS credit points) with a study load of 5 ECTS credit points, unless stated otherwise
Computational Cognitive Neuroscience [**KIM.CCN11**]
Cognitive Modelling – Complex Behaviour [**KIM.CMC11**]
Machine Learning [**KIM.ML09**]

Cognitive Language Modelling

Mandatory Course Units (15 ECTS credit points) with a study load of 5 ECTS credit points, unless stated otherwise
Computational Simulations of Language [**WMAI18003**]
Language Modelling [**KIM.LM04**]
Language Technology Project [**LIX025M05**]

Appendix IV Elective Course Units (Article 3.7)

In addition to the mandatory fixed programme and the programme specialisations, the programme also consists of 25/30 ECTS credit points in elective course units (depending on their specialisation). Students will have to fill this space of 25/30 credit points with one of the following three options (or combinations thereof):

1. A student may choose one or more of the following pre-approved elective course units that are offered by the programme itself:

Pre-approved Elective Course Units with a study load of 5 ECTS credit points, unless stated otherwise
Applied Cognitive Engineering [**WMAI19004**]
Arguing Agents [**KIM.AA08**]
Auditory Biophysics [**KIM.AB09**]
Cognitive Engineering [**KIM.CE11**]
Cognitive Modelling – Complex Behaviour [**KIM.CMC11**]
Cognitive Robotics [**WMAI19001**]
Computational Cognitive Neuroscience [**KIM.CCN11**]
Computational Models of Language [**WMAI18003**]
Computational Social Choice [**WMAI19002**]
Deep Learning [**WMAI18002**]
Design of Multi-Agent Systems [**KIM.DMAS04**]
Handwriting Recognition [**KIM.SCHR03**]
Language Modelling [**KIM.LM04**]
Logical Aspects of Multi-Agent Systems [**WMAI19003**]
Machine Learning [**KIM.ML09**]
Neuro-ergonomics [**KIM.NE06**]
Robotics for Artificial Intelligence [**KIM.ROB03**]
User Models [**KIM.UM03**]

2. A student may choose one or more of the following pre-approved elective course units taught by other degree programmes (the study load is 5 ECTS credit points unless stated otherwise). For the form of examination, refer to the EER or assessment plans of the relevant degree programmes:
   - Advanced Experimental Skills [**PSMCV-1**]
   - Advanced Imaging Techniques [**MLBI0901**]
   - Advanced Self-Organisation of Social Systems [**MLBI0801**]
   - Auditory and Visual Perception [**WMBC13001**]
   - Cognitive Psychology, Theory and Applications [**PSMCB-2**]
   - Computational Semantics [**LIX021M05**]
   - Computer-Mediated Communication [**LIX022M05**]
   - Corpus Linguistics [**LTR024M05**]
   - Data in a Digital Society [**WMCS17001**]
   - Introduction Science and Business[a] [**WNBIBEB08A**]
   - Introduction Science and Policy[a] [**WNBIBEB08B**]
   - Introduction to Data Science [**WMCS16002**]
   - Language Technology Project [**LIX025M05**]
   - Natural Language Processing [**LIX001M05**]
   - Philosophy of Neuroscience [**FI024FK**]
   - Psychophysiology and its Applications [**PSMCB-1**]
   - Science Communication Skills [**WMEC13004**]
   - Scientific Visualization [**INMSV-08**]
   - Semantic Web Technology [**LIX002M05**]
   - User Interface Evaluation [**LIX024M05**]
   - Web and Cloud Computing [**INMWCC-12**]

   a) This course yields 10 ECTS credit points. You can take either Introduction Science and Business or Introduction Science and Policy, and will only be awarded credit points for one of the two course units.

3. Formal approval of the Board of Examiners is required, in case and before a student would like to deviate from these rules (e.g. including course units from other programmes or abroad).

Appendix V Entry Requirements and Compulsory Order of Examinations (Article 4.4)

Course Unit Name	**Entry Requirements**
Applied Cognitive Engineering [**WMAI19004**]	- Cognitive Engineering [**KIM.CE11**]
Final Research Project [**KIM.AFMC06**, **KIM.AFMC30**]	- Advanced Statistical Modelling [**WMAI18001**] *or* Multivariate Models [**PSMM-5**] *or* Repeated Measures [**PSMM-2**] - Cognitive Modelling – Basic Principles and Methods [**KIM.CMB11**] - First-Year Research Project [**KIM.FYRP11**] - Formal Models of Cognition [**KIM.FMC11**]
Handwriting Recognition [**KIM.SCHR03**]	- Signals and Systems [**KIB.SENS12**]
Logical Aspects of Multi-Agent Systems [**WMAI19003**]	- Advanced Logic [**KIB.VL03**]

To meet missing entry requirements, the Board of Examiners may in individual cases define one of the entry requirement courses from the fields of logic, programming, cognitive psychology, statistics, linguistics and/or cognitive neuroscience as part of the mandatory programme found in Appendix III (for a maximum of 5 ECTS credit points).

Appendix VI Admission to the Degree Programme and Different Specialisations (Article 2.1.1, Article 2.2)

1. Students in possession of a Dutch or foreign certificate of higher education that indicates that they have the following knowledge and skills shall be admitted to the degree programme:
   - knowledge of and insight in the subject of Artificial Intelligence
   - knowledge of and insight in the subject of Cognitive Psychology or Cognitive Science
   - knowledge of and insight in the subject of Statistics and Research methods
   - practical skills in Programming

2. The holder of a certificate from the Bachelor's degree programme "Artificial Intelligence" of any university in the Netherlands is expected to have the knowledge and skills listed in Article 5.1.1 and is admitted to the degree programme on that basis.

Appendix VII Transitional Arrangement (Article 7.1)

The transitional arrangement is an arrangement that students can use if they wish to replace a course that is part of their Education and Examination Regulations, but either no longer exists or has been changed to a different course in a later set of Education of Examination Regulations. In some cases, an arrangement can consist of multiple courses. For this reason, the transitional arrangements have been separated by thick lines. If a transition is not in the list of transitional arrangements, students will have to ask the permission of the Board of Examiners first.

Discontinued Course Unit(s)				**Replacement Course Unit(s)**			
Course Name	**Course Code**	**ECTS credit points**	**Final Exam Opportunity**	**Course Name**	**Course Code**	**ECTS credit points**	**Notes**
Multi-Agent Systems	KIM.MAS03	5	-	Logical Aspects of Multi-agent Systems	WMAI19003	5	

a) There is no explicit final examination opportunity for this course, as the nature of this change is mostly in the course name.

Appendix VIII

Application and decision deadlines for admission (art. 2.6.1 and 2.6.3)

Programmes starting on 1 September 2020

Programme	Deadline of Application	Deadline of decision
Behavioural and Cognitive Neurosciences	1 May 2020	1 June 2020
Biology	1 May 2020	1 June 2020
Biomedical Engineering	1 May 2020	1 June 2020
Biomedical Sciences	1 May 2020	1 June 2020
Biomolecular Sciences	1 May 2020	1 June 2020
Ecology and Evolution	1 May 2020	1 June 2020
Energy and Environmental Sciences	1 May 2020	1 June 2020
Human-Machine Communication	1 May 2020	1 June 2020
Marine Biology	1 May 2020	1 June 2020
Mechanical Engineering	1 May 2020	1 June 2020
Medical Pharmaceutical Sciences	1 May 2020	1 June 2020
Nanoscience: for non-EU/EEA students	1 February 2020	1 June 2020
Nanoscience: for EU/EEA students	1 May 2020	1 June 2020
Science Education and Communication	1 May 2020	1 June 2020

Programmes starting on 1 September 2020 and 1 February 2021

Programme	Deadline of Application for 1 September	Deadline of decision for 1 September	Deadline of Application for 1 February	Deadline of decision for 1 February
Applied Mathematics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Applied Physics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Artificial Intelligence	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Astronomy	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Chemical Engineering	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Chemistry	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Computing Science	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Farmacie	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Industrial Engineering and Management	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Mathematics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Physics	1 May 2020	1 June 2020	15 October 2020	15 November 2020