Appendices Master's Degree Programme Human-Machine Communication 2020 - 2021

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 [**WMCC005-05**]
Cognitive Modelling: Basic Principles and Methods [**WMCC006-05**]
First-Year Research Project (15 ECTS credit points) [**WMCC012-15**]
Formal Models of Cognition [**WMCC002-05**]
Final Research Project (45 ECTS credit points)
Final Research Project (45 ECTS credit points) [**WMCC901-45**] ***or*** Final Research Project (30 ECTS credit points) [**WMCC901-30**] *and* Internship (15 ECTS credit points) [**WMCC902-15**]

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 [**WMCC008-05**]
Computational Cognitive Neuroscience [**WMCC010-05**]
User Models [**WMCC004-05**]

Cognitive Engineering

Mandatory Course Units (20 ECTS credit points) with a study load of 5 ECTS credit points, unless stated otherwise
Applied Cognitive Engineering [**WMCC007-05**]
Cognitive Engineering [**WMCC001-05**]
Neuro-ergonomics [**WMCC011-05**]
User Models [**WMCC004-05**]

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 [**WMCC010-05**]
Cognitive Modelling – Complex Behaviour [**WMCC008-05**]
Machine Learning [**WMAI010-05**]

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 [**WMAI016-05**]
Language Modelling [**WMCC003-05**]
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 Human-Machine Communication or Artificial Intelligence:

Pre-approved Elective Course Units with a study load of 5 ECTS credit points, unless stated otherwise
Applied Cognitive Engineering [**WMAI19004**]
Arguing Agents [**WMAI001-05**]
Auditory Biophysics [**WMAI013-05**]
Cognitive Engineering [**WMCC001-05**]
Cognitive Modelling – Complex Behaviour [**WMCC008-05**]
Cognitive Robotics [**WMAI003-05**]
Computational Cognitive Neuroscience [**WMCC010-05**]
Computational Simulations of Language [**WMCC009-05**]
Computational Social Choice [**WMAI016-05**]
Deep Learning [**WMAI017-05**]
Design of Multi-Agent Systems [**WMAI004-05**]
Handwriting Recognition [**WMAI019-05**]
Language Modelling [**WMCC003-05**]
Logical Aspects of Multi-Agent Systems [**WMAI020-05**]
Machine Learning [**WMAI010-05**]
Neuro-ergonomics [**WMCC011-05**]
Non-derivational Theories of Syntax [**WMCC013-05**]
Robotics for Artificial Intelligence [**WMAI011-05**]
User Models [**WMCC004-05**]

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 [**WMBY015-05**]
   - Advanced Self-Organisation of Social Systems [**WMBY017-05**]
   - Auditory and Visual Perception [**WMBC002-05**]
   - Cognitive Psychology, Theory and Applications [**PSMCB-2**]
   - Computational Semantics [**LIX021M05**]
   - Computer-Mediated Communication [**LIX022M05**]
   - Corpus Linguistics [**LTR024M05**]
   - Introduction Science and Business[a] [**WMSE001-10**]
   - Introduction Science and Policy[a] [**WMSE002-10**]
   - Introduction to Data Science [**WMCS002-05**]
   - Language Technology Project [**LIX025M05**]
   - Natural Language Processing [**LIX001M05**]
   - Philosophy of Neuroscience [**FI024FK**]
   - Psychophysiology and its Applications [**PSMCB-1**]
   - Skills in Science Communication [**WMEC006-05**]
   - Scientific Visualization [**WMCS018-05**]
   - Semantic Web Technology [**LIX002M05**]
   - User Interface Evaluation [**LIX024M05**]
   - Web and Cloud Computing [**WMCS005-05**]

   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** [a]
Applied Cognitive Engineering [**WMCC007-05**]	- Cognitive Engineering [**WMCC001-05**]
Final Research Project [**WMCC901-45**, **WMCC901-30**]	- At least 60 ECTS credit points from the master's phase (students must have this study programme approved by the Board of Examiners) - Advanced Statistical Modelling [**WMCC005-05**] - Cognitive Modelling – Basic Principles and Methods [**WMCC006-05**] - First-Year Research Project [**WMCC012-05**] - Formal Models of Cognition [**WMCC002-05**] - Completion of the specialisation relevant to the final research project
Non-derivational Theories of Syntax [**WMCC013-05**]	- General Linguistics [**WBAI022-05**]

a) In the event that a student has applied for a course to count as a course replacement, this replacement course also counts as a valid alternative for the course entry requirement in question.

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. If a transition is not in the list of transitional arrangements, students will have to ask the permission of the Board of Examiners first. Previous arrangements can be found in previous Teaching- and Examination Regulations, and are still valid, provided they have not been overridden by arrangements in newer Teaching- and Examination Regulations. There are currently no 'new' transitional provisions in the Artificial Intelligence degree programme.

Below, you can find a table of courses that are considered equivalent – but have changed course codes since the Teaching- and Examination Regulations of 2019 - 2020. While the course codes of these courses are different, these courses themselves can only be used on your diploma once. Note that this list only contains courses that have been part of previous Teaching- and Examination regulations. Any other equivalences that may exist between courses that can be beneficial in the event of a course replacement or a potential block in the event of a free-choice elective will have to be checked with the Board of Examiners of your own degree programme.

Course Name	Old Course Code	New Course Code	ECTS Credit Points
Organized by Human-Machine Communication (MSc)			
Advanced Statistical Modelling	WMAI18001	WMCC005-05	5
Applied Cognitive Engineering	WMAI19004	WMCC007-05	5
Cognitive Engineering	KIM.CE11	WMCC001-05	5
Cognitive Modelling: Basic Principles and Methods	KIM.CMB11	WMCC006-05	5
Cognitive Modelling: Complex Behaviour	KIM.CMC11	WMCC008-05	5
Computational Cognitive Neuroscience	KIM.CCN11	WMCC010-05	5
Computational Simulations of Language	WMAI18003	WMCC009-05	5
Final Research Project	KIM.AFMC30	WMCC901-30	30
Final Research Project	KIM.AFMC06	WMCC901-45	45
First-year Research Project	KIM.FYRP11	WMCC012-15	5
Formal Models of Cognition	KIM.FMC11	WMCC002-05	
Internship	KIM.STAHMC	WMCC902-15	15
Language Modelling	KIM.LM04	WMCC003-05	5
Neuro-ergonomics	KIM.NE06	WMCC011-05	5
User Models	KIM.UM03	WMCC004-05	5
Organized by Other Programmes (Mandatory / Specialisation)			
Machine Learning	KIM.ML09	WMAI010-05	5
Organized by Other Programmes (Pre-approved Elective)			
Advanced Imaging Techniques	MLBI0901	WMBY015-05	5
Advanced Self-organisation of Social Systems	MLBI0801	WMBY017-05	5
Arguing Agents	KIM.AA08	WMAI001-05	5
Auditory Biophysics	KIM.AB09	WMAI013-05	5
Auditory and Visual Perception	WMBC13001	WMBC002-05	5
Cognitive Robotics	WMAI19001	WMAI003-05	5
Computational Social Choice	WMAI19002	WMAI016-05	5
Deep Learning	WMAI18002	WMAI017-05	5
Design of Multi-agent Systems	KIM.DMAS04	WMAI004-05	5
Hand-writing Recognition	KIM.SCHR03	WMAI019-05	5
Introduction to Data Science	WMCS16002	WMCS002-05	5

Introduction to Science and Business	WNBIBEB08A	WMSE001-10	10
Introduction to Science and Policy	WNBIBEB08B	WMSE002-10	10
Logical Aspects of Multi-agent Systems	WMAI19003	WMAI020-05	5
Machine Learning	KIM.ML09	WMAI010-05	5
Robotics for AI	KIM.ROB03	WMAI011-05	5
Scientific Visualisation	INMSV-08	WMCS018-05	5
Skills in Science Communication	WMEC13004	WMEC006-05	5
Web and Cloud Computing	INMWCC-12	WMCS005-05	5

Appendix VIII

Application Deadlines for Admission (Article 2.6.1)

Deadline of Application	Non-EU students	EU students
Nanoscience	February 1st 2020	May 1st 2020
All other FSE Masters	May 1st 2020	May 1st 2020

Decision Deadlines (Article 2.6.3)

Deadline of Decision	Non-EU students	EU students
All FSE Masters	November 1st 2020	June 1st 2020