Appendices Master's Degree Programme Artificial Intelligence 2017 - 2018

Appendix I Learning Outcomes of the Degree Programme (Article 1.3)

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 five of the research areas below. In one research area of Artificial Intelligence the master has specialized 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. 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 Artificial Intelligence.

4. The master demonstrates relevant knowledge and the ability to use algorithms, data structures and important programming languages used in Artificial Intelligence.

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 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. The master has the ability to critically reflect on his/her 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.

Appendix II Specializations of the Degree Programme (Article 2.2)

Students must choose one of the following specializations:
a) specialization Computational Intelligence and Robotics
b) specialization Multi-Agent Systems

Appendix III Content of the Degree Programme
(Article 2.3)

1. The **degree programme** consists of the following mandatory course units with a study load of 5 ECTS unless otherwise stated:

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Cognitive Robotics [**KIM.CROB04**]
Machine Learning [**KIM.ML09**]
Multi-Agent Systems [**KIM.MAS03**]
Final Research Project (45 ECTS) [**KIM.AFAI06**]

To meet missing entry requirements, the Board of Examiners may in individual cases define one other mandatory course units (5 ECTS) from the following fields: logic, programming, cognitive psychology, statistics, linguistics or cognitive neuroscience.

2. The different **specializations** also contain the following mandatory course units with a study load of 5 ECTS:

Computational Intelligence and Robotics

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Pattern Recognition [**INMPR-08**]
Handwriting Recognition [**KIM.SCHR03**]
Robotics for Artificial Intelligence [**KIM.ROB03**]

Multi-Agent Systems

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Arguing Agents [**KIM.AA08**]
Cognitive Modelling – Basic Principles and Methods [**KIM.CMB11**]
Design of Multi-Agent Systems [**KIM.DMAS04**]

Appendix IV Elective Course Units
(Article 2.4)

1. With the approval of the Board of Examiners, a student may choose one or more of the following elective course units with a study load of 5 ECTS:

Elective course units with a study load of 5 ECTS, unless otherwise stated
Arguing Agents [**KIM.AA08**]
Auditory Biophysics [**KIM.AB09**]
Cognitive Engineering [**KIM.CE11**]
Cognitive Modelling – Basic Principles and Methods [**KIM.CMB11**]
Cognitive Modelling – Complex Behaviour [**KIM.CMC11**]
Computational Cognitive Neuroscience [**KIM.CCN11**]
Computational Discourse [**KIM.CD09**]
Design of Multi-Agent Systems [**KIM.DMAS04**]
Handwriting Recognition [**KIM.SCHR03**]
Language Modelling [**KIM.LM04**]
Neuro-ergonomics [**KIM.NE06**]
Robotics for Artificial Intelligence [**KIM.ROB03**]
User Models [**KIM.UM03**]

2. With the approval of the Board of Examiners, a student may also choose one or more of the following elective course units taught by other degree programmes with a study load of 5 ECTS unless otherwise stated (for form of examination refer to the Teaching and Exam regulations or assessment plans of the appropriate Degree Programmes):

- Advanced Computer Graphics [**INMACG-08**]
- Advanced Imaging Techniques [**MLBI0901**]
- Advanced Self-Organisation of Social Systems [**MLBI0801**]
- Auditory and Visual Perception [**WMBC13001**]
- Computational Semantics [**LIX021M05**]
- Language Technology Project [**LIX025M05**]
- Computer Vision [**INMCV-08**]
- Dynamic Logic [**INMDL-08**]
- Introduction Science and Business[a] [**WNBIBEB08A**]
- Introduction Science and Policy[a] [**WNBIBEB08B**]
- Natural Language Processing [**LIX001M05**]
- Neural Networks and Computational Intelligence [**WMCS15001**]
- Pattern Recognition [**INMPR-08**]
- Philosophy of Neuroscience [**FI024FK**]
- Programming in C++[b] [**RC-C++1**, **RC-C++2**, **RC-C++3**]
- Robotics for Industrial Engineering and Management [**TBROB-12**]
- Science Communication Skills [**WMEC13004**]
- Scientific Visualization [**INMSV-08**]
- Semantic Web Technology [**LIX002M05**]
- 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.
b) Part I, Part II and Part III combine to a maximum of 8 ECTS credit points. Part I yields 2 ECTS credit points. If you take two out of three parts, you will receive 5 ECTS credit points.

Appendix V Entry Requirements and Compulsory Order of Examinations
(Article 3.4)

Course Unit Name	Entry Requirements
Final Research Project [**KIM.AFAI06**]	− At least 60 ECTS credit points from the Master's phase
Robotics for Artificial Intelligence [**KIM.ROB03**]	− Cognitive Robotics [**KIM.CROB04**] *or* Autonomous Systems Practical [**KIB.PAS05**]
Handwriting Recognition [**KIM.SCHR03**]	− Signals and Systems [**KIB.SENS12**]
Multi-Agent Systems [**KIM.MAS03**]	− Advanced Logic [**KIB.VL03**] *or* Dynamic Logic [**INMDL-08**]

Appendix VI Admission to the Degree Programme and Different Specializations
(Article 5.1.1 + Article 5.2)

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 Knowledge Systems
   - knowledge of and insight in the subject of Autonomous Systems
   - knowledge of and insight in the subject of Mathematics, notably discrete and continuous mathematics
   - knowledge of and insight in the subject of Statistics
   - knowledge of, insight in and practical skills in the subject of Computer Science, notably programming, data structures and search techniques
   - knowledge of and insight in the subject of Logics, notably set theory, predicate logic and modal logic
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)

There are currently no transitional provisions in the Artificial Intelligence degree programme.

Appendix VIII

**Application Deadlines for Admission
(Article 5.6.1)**

Deadline of Application	Non-EU students	EU students
Nanoscience	February 1st 2018	May 1st 2018
Behavioural and Cognitive Neurosciences	May 1st 2018	May 1st 2018
Biomolecular Sciences (top programme)	May 1st 2018	May 1st 2018
Evolutionary Biology (top programme)	May 1st 2018	May 1st 2018
Remaining FSE Masters	May 1st 2018	May 1st 2018

**Decision Deadlines
(Article 5.6.3)**

Deadline of Decision	Non-EU students	EU students
Nanoscience	June 1st 2018	June 1st 2018
Behavioural and Cognitive Neurosciences	June 1st 2018	June 1st 2018
Biomolecular Sciences (top programme)	June 1st 2018	June 1st 2018
Evolutionary Biology (top programme)	June 1st 2018	June 1st 2018
Remaining FSE Masters	November 1st 2018	November 1st 2018