Appendices master's degree programme
Human Machine Communication
2016-2017

Appendix I   Teaching outcomes of the degree programme (art. 1.3)

1. The master demonstrates knowledge, understanding and the ability to evaluate, analyze 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 specialized 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- and speech 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 analyzing 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, analyze 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   Specializations of the degree programme (art. 2.2)

Students must choose one of the following specializations:
a) specialization Cognitive Modeling
b) specialization Cognitive Engineering
c) specialization Computational Cognitive Neuroscience
d) specialization Cognitive Language Modeling

Appendix III   Content of the degree programme (art. 2.3)

1. The **degree programme** consist 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
Formal Models of Cognition
Cognitive Modeling – Basic Principles and Methods
Multivariate Models *or* Repeated Measures
First-Year Research project (15 ECTS)
Final Research Project (45 ECTS) *or* Final Research Project (30 ECTS) *and* Internship (15 ECTS)

To meet missing entry requirements, the Board of Examiners may in individual cases define one other mandatory course unit (5 ECTS) from the following fields: 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:

Cognitive Modeling

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Cognitive Modeling – Complex Behaviour
User Models
Computational Cognitive Neuroscience

Cognitive Engineering

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Cognitive Engineering
Neuro-ergonomics
User Models

Computational Cognitive Neuroscience

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Computational Cognitive Neuroscience
Cognitive Modeling – Complex Behaviour
Neural Networks and Computational Intelligence

Cognitive Language Modeling

Mandatory course units with a study load of 5 ECTS, unless otherwise stated
Language Modeling
Computational Discourse
Language Technology Project

Appendix IV   Electives (art. 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
Auditory Biophysics
Cognitive Engineering
Cognitive Modeling – Complex Behaviour
Cognitive Robotics
Computational Cognitive Neuroscience
Computational Discourse
Design of Multi-Agent Systems
Handwriting Recognition
Language Modeling
Machine Learning
Multi-Agent Systems
Neuro-ergonomics
Robotics
Signals and Systems
Sound Recognition
User Models

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 of the appropriate Degree Programmes):

- Advanced Experimental Skills
- Advanced Imaging Techniques
- Advanced Self-Organisation of Social Systems
- Auditory and Visual Perception
- Cognitive Psychology, Theory and Applications
- Computational Semantics
- Computer-Mediated Communication
- Corpus Linguistics
- Dutch Semantics and Language Acquisition (10 ECTS)
- Introduction Science and Business (10 ECTS)
- Introduction Science and Policy
- Language Technology Project
- Natural Language Processing
- Philosophy of Neuroscience
- Programming in C++ (part I, II and/or part III: together max. 8 ECTS; part I max. 2 ECTS)
- Psychophysiology and its applications
- Scientific Visualization
- Semantic Web Technology
- User Interface Evaluation
- Vaardigheden Wetenschapseducatie en –communicatie*
- Web and Cloud Computing

*This course unit is taught in Dutch

Appendix V Entry requirements and compulsory order of examinations (art. 3.4)

- Final Research project:
    - Formal Models of Cognition, *and*
    - Cognitive Modeling – Basic Principles and Methods, *and*
    - Multivariate Models **or** Repeated Measures, *and*
    - Research Project (15 ECTS), *and*
    - at least 60 ECTS of the degree programme.
- Robotics:
    - Cognitive Robotics *or*
    - Autonomous Systems Practical
- Handwriting Recognition:
    - Signals and Systems
- Multi Agent Systems:
    - Advanced Logic *or*
    - Automated Reasoning

Appendix VI Admission to the degree programme and different specializations (art. 5.1.1 + art. 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 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 4.1.1 and is admitted to the degree programme on that basis.

Appendix VII

Application deadlines for admission
(art. 5.6.1)

Deadline of Application	Non-EU students	EU students
Nanoscience	February 1st 2017	May 1 st 2017
Behavioural and Cognitive Neurosciences	May 1st 2017	May 1st 2017
Biomolecular Sciences (topprogramme)	May 1st 2017	May 1st 2017
Evolutionary Biology (topprogramme)	May 1st 2017	May 1st 2017
Remaining FMNS Masters	May 1st 2017	May 1st 2017

Decision deadlines
(art. 5.6.3)

Deadline of Decision	Non-EU students	EU students
Nanoscience	June 1st 2017	June 1st 2017
Behavioural and Cognitive Neurosciences	June 1st 2017	June 1st 2017
Biomolecular Sciences (topprogramme)	June 1st 2017	June 1st 2017
Evolutionary Biology (topprogramme)	June 1st 2017	June 1st 2017
Remaining FMNS Masters	November 1st 2017	November 1st 2017