

Appendices master's degree programme Human Machine Communication 2014-2015

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 a forefront 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 Human Machine Communication.
5. The master has the ability to, on an international academic level, analyze problems, critically and constructive 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, for both specialists and non-specialists.
6. The master has the ability to critically reflect on one's 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 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 compulsory modules with a study load of 5 ECTS unless otherwise stated:

Compulsory modules with a study load of 5 ECTS, unless otherwise stated	Practical
Formal Models of Cognition	yes
Cognitive Modeling – Basic Principles and Methods	yes
Multivariate Models <i>or</i> Repeated Measures	yes
Research project (15 ECTS)	yes
Final Research Project (45 ECTS) <i>or</i> Final Research Project (30 ECTS) and Internship (15 ECTS)	yes

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

2. The different **specializations** also contain the following compulsory modules with a study load of 5 ECTS:

Cognitive Modeling

Compulsory modules with a study load of 5 ECTS, unless otherwise stated	Practical
Cognitive Modeling – Complex Behaviour	yes
User Models	yes
Computational Cognitive Neuroscience	yes

Cognitive Engineering

Compulsory modules with a study load of 5 ECTS, unless otherwise stated	Practical
Cognitive Engineering	yes
Neuro-ergonomics	
User Models	yes

Computational Cognitive Neuroscience

Compulsory modules with a study load of 5 ECTS, unless otherwise stated	Practical
Computational Cognitive Neuroscience	yes
Cognitive Modeling – Complex Behaviour	yes
Advanced Experimental Skills	yes

Cognitive Language Modeling

Compulsory modules with a study load of 5 ECTS, unless otherwise stated	Practical
Language Modeling	yes
Computational Discourse	yes
Computational Simulations of Language Behaviour	yes

Appendix IV Optional course units (art. 2.4)

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

Elective course units with a study load of 5 ECTS, unless otherwise stated	Practical
Arguing Agents	yes
Auditory Biophysics	
Cognitive Engineering	yes
Cognitive Modeling – Complex Behaviour	yes
Cognitive Robotics	yes
Computational Cognitive Neuroscience	yes
Computational Discourse	yes
Design of Multi-Agent Systems	yes
Handwriting Recognition	yes
Language Modeling	yes
Machine Learning	yes
Multi-Agent Systems	yes
Neuro-ergonomics	
Perception	yes
Robotics	yes
Signals and Systems	yes
Sound Recognition	yes
User Models	yes

2. With the approval of the Board of Examiners, a student may also choose one or more of the following optional modules 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 Self-Organisation of Social Systems
- Cognitive Psychology (Psychology)
- Computational Semantics
- Computational Simulations of Language Behaviour
- Computer-Mediated Communication
- Corpus Analysis
- Dutch Semantics and Language Acquisition (10 ECTS)
- Introduction Science and Business (10 ECTS)
- Natural Language Processing
- Philosophy of Language
- 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
- Repeated Measures
- 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. 3.2)

- 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 *or*
 - Logic 3 (Model, oneindigheid en paradox)

Appendix VI Admission to the degree programme and different specializations (art. 4.1.1 + art. 4.2)

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.