

**UNIVERSITY OF AMSTERDAM**  
**FACULTY OF SCIENCE**  
**EDUCATION AND EXAMINATION REGULATIONS**  
**PART B: programme-specific section**  
**Academic year 2016-2017**  
**MASTER'S PROGRAMME ARTIFICIAL INTELLIGENCE**

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## **Chapter 1. General Provisions**

### *Article 1.1 – Definitions*

In addition to part A, the following definitions are used in part B

Personal Education Plan (PEP) An individual study plan for the student's Master programme.

### *Article 1.2 – Study programme information*

1. The Master's programme Artificial Intelligence (AI), CROHO number 66981, is offered on a full-time basis and the language of instruction is English. This means that the Code of Conduct for Foreign Languages at the UvA applies for this programme (see Code of Conduct Governing Foreign Languages at the University of Amsterdam 2000 at the website: <http://www.uva.nl/en/about-the-uva/uva-profile/rules-and-regulations/teaching/teaching.html>).
2. The programme consists of a two-year programme with a total study load of 120 EC.

### *Article 1.3 – Enrolment*

The programme is offered starting in the first semester of the academic year (1 September). The intake dates mentioned in this paragraph ensure a programme that can be expected to be completed within the time set for the programme.

## Chapter 2. Programme objectives and exit qualifications

### Article 2.1 – Programme objectives

A student who has obtained the degree of Master in Artificial Intelligence will have extensive knowledge and understanding of Artificial Intelligence. The Master programme is designed according to the following objectives:

1. *Knowledge and understanding*, the student is able to formulate a research plan, able to judge the quality of his/her own work and the work of others, and is able to understand the key areas in Artificial Intelligence.
2. *Applying knowledge and understanding*, the student is able to solve complex problems and applies his/her knowledge and understanding of this in a scientific manner.
3. *Making judgements*, the student is able to formulate an opinion or judgement on the basis of possibly incomplete information.
4. *Communication*, the student can communicate information to audiences of specialists as well as non-experts.
5. *Learning skills*, the student is able to detect and adjust missing knowledge accordingly.

### Article 2.2 – Exit qualifications

Anyone who has obtained a Master degree in AI:

1. has thorough knowledge of the current theories, methods and techniques in the field of Artificial Intelligence;
2. has specialized knowledge of at least one of the following Artificial Intelligence subfields:
  - Machine Learning
  - Knowledge Representation
  - Computer Vision
  - Natural Language Processing
  - Information Retrieval
  - Computational Intelligence
  - Multi-Agent Systems
3. has the capability to apply this knowledge to analyse, design and develop AI-systems;
4. can formulate scientific questions and is able to solve problems with the aid of abstraction and modelling;
5. is able to contribute to further developments of the theories, methods and techniques of AI in a scientific context;
6. is able to express him/herself clearly on a technical/mathematical and general level;
7. is aware of the social context and consequences of conducting AI research and work;
8. can obtain an academic position at a university or research centre or scientific/applied position in the industry.

## Chapter 3. Further admission requirements

### *Article 3.1 – Admission requirements*

1. Admission to the Master's Programme in Artificial Intelligence is possible for students with one of the following qualifications:
  1. A Dutch Bachelor degree in 'Artificial Intelligence' or 'Computer Science';
  2. A Bachelor degree from the University of Amsterdam of the 'Bèta-Gamma' or 'Future Planet Studies' programme with a major in 'Artificial Intelligence';
  3. A Dutch or foreign qualification comparable to the one described in paragraph 3.1.1.
  4. Applicants mentioned under 3.1.1.3. are evaluated on an individual basis. The evaluation and procedures of the diplomas are according to the Nuffic criteria. The programme director assesses if the applicant has the general level and the required knowledge and skills to complete the compulsory part of the programme. These include the following:
    - Good academic level
    - Basic mathematics (calculus, statistics and probability, linear algebra)
    - Programming skills
    - Basic Computer Science or Artificial Intelligence
2. The Examinations Board will review every application for admission. At the request of a student, the Examinations Board may deviate from the provisions above.

### *Article 3.2 – Pre-Master's programme*

1. Students with a Bachelor's degree in a field that corresponds to a sufficient extent with the subject area covered by the Master's programme can be admitted after completing a Pre-Master's programme.
2. The Pre-Master's programme comprises a maximum of 30 EC and must be completed within one year.
3. A student can be admitted under the condition that he or she successfully completes the Pre-Master programme before the Master programme starts.

### *Article 3.3 – Limited programme capacity*

Not applicable.

### *Article 3.4 – Final deadline for registration*

A request for admission to the Master's programme starting in September must be submitted to Studielink and the Faculty before 1 May in the case of Dutch students, before 1 April in the case of EU students and before 1 February in the case of non-EU students. Under exceptional circumstances, the Examinations Board may consider a request submitted after this closing date.

#### *Article 3.5 – English language requirements*

1. The proficiency requirement in English as the language of instruction can be met by the successful completion of one of the following examinations or an equivalent:
  1. IELTS-test: minimum score 6.5, at least 6 on each sub-score (listening/reading/writing/speaking).
  2. TOEFL Test: the minimum scores required are:
    - Internet-based test (iBT): 90
    - Computer-based test (CBT): 235
    - Paper-based test (PBT): 580The TOEFL-code for the Faculty of Science of the Universiteit van Amsterdam is: 8628.
  3. A Cambridge Examination Score with a minimum test result of CAE B will also be accepted. For the CPE test a minimal score of C is required.
2. Those possessing a Bachelor's degree from a Dutch university or have an English-language 'international baccalaureate' diploma satisfy the requirement of sufficient command of the English language.

#### *Article 3.6 – Free curriculum*

1. Subject to certain conditions, the student has the option of compiling a curriculum of his/her own choice which deviates from the curricula prescribed by the programme.
2. The details of such a curriculum must be approved beforehand by the Examinations Board of the master's programme.
3. The free curriculum is put together by the student and must at least have the size, breadth and depth of a regular Master's programme.
4. The following conditions must at least have been met in order to be eligible for the Master's degree:
  - a. at least 60 EC must be obtained from the regular curriculum.
  - b. the level of the programme must match the objectives and exit qualifications that apply for the programme for which the student is enrolled.

## **Chapter 4. Curriculum structure**

#### *Article 4.1 – Composition of programme*

1. The programme consists of the following components:
  1. General compulsory components amounting to 78 EC, including the Master Thesis AI (36 EC),
  2. Constrained Choice components amounting to 30 EC,
  3. Elective components amounting to 12 EC.
2. A complete list of components provided by the Master's programme can be found in Appendix 1.
3. Every component will be tested. Within the Master's programme AI different types of testing are used. This is described per component in the course catalogue.
4. Within the Master's programme AI different types of teaching methods are used. This is described per component in the course catalogue.

#### Article 4.2 – Compulsory components

Within the AI programme, 42 EC worth of courses and the Master Thesis (36 EC) are obligatory. In addition, students can choose 30 EC worth of courses from a Constrained Choice courses list.

<b>Compulsory components</b>	<b>42 + 36 EC required</b>
Machine Learning 1	6
Knowledge Representation	6
Computer Vision 1	6
Computational Intelligence	6
Information Retrieval 1	6
Natural Language Processing 1	6
Multi-Agent Systems	6
Master Thesis AI	36

<b>Constrained Choice components</b>	<b>30 EC required</b>
Applied Language Technology	6
Applied Mechanism Design and Big Data	6
Computational Semantics and Pragmatics	6
Computational Social Choice	6
Computer Vision 2	6
Data Mining Techniques (VU)	6
Deep Learning	6
Evolutionary Computing (VU)	6
Game Theory	6
Information Retrieval 2	6
Information Visualization	6
Knowledge Engineering (VU)	6
Knowledge Representation on the Web	6
Machine Learning 2	6
Natural Language Processing 2	6
Project AI*	6
Project Artificial Intelligence 2*	6
Project Artificial Intelligence 3*	6
Seminar Combining Symbolic and Statistical Methods in AI	6
Technology for Games	6
Unsupervised Language Learning	6

\*See article 4.10 for requirements regarding projects.

#### Article 4.3 – Practical exercise

In addition to, or instead of, classes in the form of lectures, the elements of the Master's programme often include a practical component as defined in article 1.2 of part A.

#### Article 4.4 – Elective components

1. Students can choose up to 12 EC worth of elective components either from the AI programme or from other Master programmes.
2. For courses from other programmes, prior approval is needed from the programme director and Examinations Board.

#### *Article 4.5 – Sequence of examinations*

1. The student may start with the Master Thesis AI project if the study programme has been approved by the Examinations Board. For this purpose, a completed PEP form has to be submitted to the Examinations Board. The PEP form should contain a full list of completed and unfinished courses and a planning for the unfinished courses.
2. At the request of a student, the Examinations Board may deviate from the provisions of paragraph 1 for the benefit of this student.
3. The assessment of projects in which several students have worked on an assignment will only be made at the end of the relevant teaching period. In principle, an individual resit is not possible.
4. If a student feels that on account of exceptional circumstances the assessment, referred to in paragraph 3, is not a realistic assessment of his/her effort, knowledge, skills or insights, the student may request the Examinations Board to nevertheless permit an individual test and/or resit.

#### *Article 4.6 – Participation in practical exercise and study group sessions*

Not applicable

#### *Article 4.7 – Maximum exemption*

A maximum of 30 EC in the programme can be accumulated through granted exemptions.

#### *Article 4.8 – Validity period of examinations*

The validity period of interim examinations and exemptions from interim examinations is limited, as described in part A, article 4.8.

#### *Article 4.9 – Degree*

Students who have successfully completed their Master's examination are awarded a Master of Science degree. The degree awarded is stated on the diploma.

#### *Article 4.10 – Internship/project*

1. 6 or 12 EC of the constrained choice components may be used for an external internship or one or two individual projects. A student can use at most 12 EC for both internships/projects and the constrained choice course *Project AI*.
2. The prior approval of the Examinations Board is required for an internship/project to be included in the student's study programme. To obtain approval for an internship/project the student will prepare a proposal that includes a description including the aim and content of the internship/project, a description of the work that will be done, a planning and the intended deliverable for assessment. The student finds a supervisor for the internship/project among the staff affiliated with the Master programme.
3. Participation in a summer school may also be regarded as an external internship/project.

#### *Article 4.11 – Double Master's programme*

In order to be awarded two Master's degrees or to have stated on the Master's diploma that two Master's programmes have been completed within the discipline, the following requirements must be met:

1. The total programme of the candidate should amount to at least 180 ECTS credits.
2. The candidate's work for the programme (lectures, research work, etc.), must be of such a standard that all the compulsory requirements of each of the two programmes have been met.
3. The candidate must have conducted separate research work for both Master's degrees. This may consist of two separate Master theses with supervisors from the respective study programmes.

The Examinations Boards of both study programmes must approve the student's double Master's programme before the student commences the double Master's programme.

## Chapter 5. Transitional and final provisions

### Article 5.1 - Amendments and periodic review

1. Any amendment to the Education and Examination Regulations will be adopted by the dean after taking advice from the relevant Board of Studies. A copy of the advice will be sent to the authorised representative advisory body.
2. An amendment to the Education and Examination Regulations requires the approval of the authorised representative advisory body if it concerns components not related to the subject of Section 7.13, paragraph 2 sub a to g and v, and paragraph 4 of the WHW and the requirements for admission to the Master's programme.
3. An amendment to the Education and Examination Regulations is only permitted to concern an academic year already in progress if this does not demonstrably damage the interests of students.

### Article 5.2 – Transitional provisions

By way of departure from the Education and Examination Regulations currently in force, the following transitional provisions apply for students who started the programme under a previous set of Education and Examination Regulations:

#### Transitional Provisions for students who started in 2011-2012 or earlier

Old component	Replacement in 2013-2014	Remarks
Multi-Agent Systems 3 EC	Autonomous Agents 6 EC	Students that did not pass Multi-Agent Systems in 2011-2012 or earlier will do half of Autonomous Agents for 3 EC
Autonomous Agents and Multi-Agent Systems 6 EC	Advanced Topics in Autonomous Agents 6 EC	
Knowledge Representation 3 EC	Students that did not pass Knowledge Representation in 2011-2012 or earlier will be offered an alternative of 3 EC in consultation with the Programme Director	

#### Transitional Provisions for students who started in 2012-2013 or earlier

Old component	Replacement in 2013-2014	Remarks
Web Text Mining	Applied Language Technology	Course content will be the same



**Transitional Provisions for students who started in 2013-2014 or earlier**

Old component	Replacement in 2014-2015	Remarks
Information Retrieval	Information Retrieval 1	New course is 6 EC, old 3 EC
Autonomous Agents	Autonomous Agents 1	
Intelligent Multimedia Systems	Computer Vision 1	
Machine Learning: Pattern Recognition	Machine Learning 1	
Machine Learning: Principles and Methods	Machine Learning 2	
Elements of Language Processing and Learning	Natural Language Processing 1	New course is 6 EC, old 3 EC
Project AI	-	Students who started in 2013-14 and did not yet complete this project will be given the opportunity to do a project by individual arrangement.
Advanced Information Retrieval	Information Retrieval 2	
Advanced Topics in Autonomous Agents	Autonomous Agents 2	
Computer Vision	Computer Vision 2	
Game Programming	Technology for Games	
Statistical Structure in Language Processing	Natural Language Processing 2	

**Transitional Provisions for students who started in 2014-2015 or earlier**

Old component	Replacement in 2015-2016	
Autonomous Agents 1	Multi-Agent Systems	
Autonomous Agents 2	-	No replacing course available, other course in consultation with programme director and Examinations Board

Students who have started with their master programme in 2014 or earlier can choose to either follow the curriculum as written down in the TER 2014-2015, or follow the new curriculum as written down in this document. The programme director should be consulted in case of doubt. The study programme has to be approved by the Examinations Board.

**Article 5.3 - Publication**

1. The Dean of the faculty will ensure the appropriate publication of these Regulations and any amendments to them.
2. The Education and Examination Regulations will be posted on the faculty website and deemed to be included in the course catalogue.

**Article 5.4 – Effective date**

These Regulations enter into force with effect from 1 September, 2016.

Thus drawn up by the Dean of the Faculty of Science on 18 July 2016.

## Appendix 1 List of components provided by the study programme

Component	Code	Study load (EC)	Semester	Teaching method	Assessment
Applied Language Technology	5204APLT6Y	6	1	L, PR, CP	Written, oral
Applied Mechanism Design and Big Data	5284AMDB6Y	6	1	L, CP	Written
Computational Intelligence	5204COIN6Y	6	1	L	Written
Computational Semantics and Pragmatics	5314COSP6Y	6	1	L	Written, oral
Computational Social Choice	5314COSC6Y	6	1	L, PR	Written, oral
Computer Vision 1	52041COV6Y	6	1	L, PR, CP	Written
Computer Vision 2	52042COV6Y	6	2	L, CP	Written, oral
Data Mining Techniques (VU)	52848DAM6Y	6	2	L, PR, GP	Written
Evolutionary Computing (VU)	52848EVC6Y	6	1	L	Written
Game Theory	5314GATH6Y	6	2	L	
Information Retrieval 1	52041INR6Y	6	1	L, CP	Written
Information Retrieval 2	52042INR6Y	6	2	L, CP	Written, oral
Information Visualization	5204INVI6Y	6	2	L, CP	Written, oral
Knowledge Engineering (VU)	52948KNE6Y	6	1	L, GP	Written
Knowledge Representation	5204KNRE6Y	6	1	L, PR, CP	Written
Knowledge Representation on the Web	5204KROT6Y	6	2	L, CP, GP	Written
Machine Learning 1	52041MAL6Y	6	1	L, PR, CP	Written
Machine Learning 2	52042MAL6Y	6	2	L, PR, CP	Written
Master Thesis AI	5204MTA42Y	36	1 & 2	IC	Written, oral
Multi-Agent Systems	5204MUAS6Y	6	2	L, CP	Written
Natural Language Processing 1	52041NLP6Y	6	1	L, CP	Written
Natural Language Processing 2	52042NLP6Y	6	2	L, CP	Written, oral
Project AI	5204PRAI6Y	6	1 & 2	GP	Written, oral
Project Artificial Intelligence 2	52042PRA6Y	6	1 & 2	IC	Written, oral
Project Artificial Intelligence 3	52043PRA6Y	6	1 & 2	IC	Written, oral
Seminar Combining Symbolic and Statistical Methods in AI		6	2	L	Written, oral
Technology for Games	5294TEFG6Y	6	1	L, CP	Written, oral
Unsupervised Language Learning	5204UNLL6Y	6	2	L, CP	Written, oral

L = Lectures, LS = Lab sessions, CP = Computer practical, PR = practical, IC = Individual coaching, GP = Group project