UNIVERSITY OF AMSTERDAM

FACULTY OF SCIENCE

TEACHING AND EXAMINATION REGULATIONS
PART B: programme-specific section

Academic year 2018 – 2019

MASTER'S PROGRAMME ARTIFICIAL INTELLIGENCE

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
   - Evolutionary Computing
   - 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., complemented by a necessary basic knowledge of Computer Science (at least 12 EC), basic programming skills (at least 12 EC), basic university level Calculus (at least 6 EC), basic university level Linear Algebra (at least 6 EC), basic university level Probability and Statistics (at least 6 EC) and a motivation which matches the content of the Master's programme.
    4. In addition to these basic requirements we will instate the additional requirements as described in article 3.3.
2. In addition to the requirements referred to in paragraph 1, the student has to comply with the following requirements:
    a. The Bachelor's Grade Point Average (GPA) is at least 6.5 (according to the Dutch grading system). The GPA is the average of the Bachelor's course grades weighed by course/ study load.
    b. The student has obtained the Bachelor's degree within at most 3 year more than the nominal duration of the programme.
3. Without prejudice to the provisions of paragraph 1 the Admissions Board may grant admission to the programme when concluding that the previous education of the candidate is equivalent to the Bachelor's degrees referred to in paragraph 3.1.1. The Admissions Board decides in such cases for every student whether the previous education of the candidate had deficiencies for admission.
4. When the programme commences, the candidate must have fully completed the Bachelor's programme, allowing admission to this Master's programme.

Article 3.2 – Pre-Master's programme
Not applicable

Article 3.3 – Limited programme capacity
1. The Dean has announced the maximum programme's capacity. Up to, but no more than, 120 students are admitted to the Master's programme Artificial Intelligence as a whole.
2. Candidates will be selected in the following way. First, students will have to meet the additional requirements as stated in par 3.1. and subsequently the students eligible for admission to the programme will be ranked by the ranking criteria as stated in par 3.3.3.
3. Selection will be based on the following ranking criteria:
    a. GPA score ;
    b. Duration of completing the Bachelor's programme

c. Publications
   d. Relevant AI projects (completed)
   e. Programming skills
   f. Knowledge of logic
   g. Motivation for contents Master's programme
   h. Relevant AI courses at level of Master's programme

4. The Admissions Board will judge requests for admission on criteria mentioned in article 3.3 and select students on an individual basis and in comparison to the other applicants. These criteria will not be applied mechanically, but manually with careful consideration and judgement. For example, the value of the GPA may depend on a students' curriculum, publications may be more or less high ranked, etc.

5. The top 120 students on the ranking list will be admitted to the master's programme. The Admissions Board which will grant admission to the selected candidates.

6. Current students in the Bachelor's programme KI at the University of Amsterdam will be given the opportunity to adjust to the additional requirements and ranking criteria. Therefore we will adapt the ranking criteria to year of study for students in UvA bachelor's programme Kunstmatige Intelligentie, Future Planet Studies or Bèta-gamma with a Major in Kunstmatige Intelligentie:
   a. Bachelor students who are in their third year of registration in 2018 - 2019: no additional requirements will be applied.
   b. Bachelor students who are in their second year of registration in 2018 - 2019:
      1. GPA is at least 6,5 over second and third year Bachelor's programme (instead of all three years)
      2. The student has obtained the Bachelor's degree within at most 3 years more than the nominal duration of the programme (6 years in total).
   c. Bachelor students who are in the first year of registration in 2018 – 2019:
      1. The Bachelor's GPA is at least 6,5 (all three years)
      2. The student has obtained the Bachelor's degree within at most
         3 year more than the nominal duration of the programme
         (6 years in total).

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 May 1st in the case of EU/EEA/Swiss students, and before February 1st in the case of non-EU/EEA/Swiss students. Under exceptional circumstances, the Admissions 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:
   a. IELTS: 7, at least 7 on each sub-score writing and speaking, at least 6,5 on each sub-score listening and reading;
   b. TOEFL paper-based: 580;
   c. TOEFL Internet-based test: 98, at least 24 on each sub-score writing and speaking, at least 22 on each sub-score listening and reading;
   The foregoing examination must have been taken within two years before the student's enrolment.
   d. C1 Advanced: A or B;
   e. C2 Proficiency: minimal score of C
   Please note that the TOEFL-code for the Faculty of Science of the University of Amsterdam is 8628.

2. An exemption from the English examination referred to in the first paragraph shall be granted to students who:
   a. had previous education in secondary or tertiary education in one of the following English-speaking countries: Australia, Canada (English), New Zealand, Ireland, the United Kingdom or the United States of America;
   b. hold an English-language 'international baccalaureate' diploma;
   c. possessing a Bachelor's degree from a Dutch university satisfy the requirement of sufficient command of the English language;
   d. passed the final examination for the subject of English as part of one of the following diplomas: VWO, Belgian ASO (Flemish).

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 Appendix 1 and the course catalogue.
4. Within the Master's programme AI different types of teaching methods are used. This is described per component in Appendix 1 and 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.

Compulsory components	42 + 36 EC required
Machine Learning 1	6
Knowledge Representation	6
Computer Vision 1	6
Evolutionary Computing (VU)	6
Information Retrieval 1	6
Natural Language Processing 1	6
Multi-Agent Systems	6
Master Thesis AI	36

Constrained Choice components	30 EC required
Computational Semantics and Pragmatics	6
Computational Social Choice	6
Computer Vision 2[1]	6
Data Mining Techniques (VU)	6
Deep Learning	6
Deep Learning for Natural Language Technology	6

Game Theory	6
Information Retrieval 2	6
Information Theory	6
Information Visualization	6
Knowledge Engineering (VU)	6
Knowledge Representation on the Web	6
Machine Learning 2[2]	6
Machine Learning for Natural Language Processing	6
Natural Language Processing 2	6
Probabilistic Robotics	6
Project AI*	6
Project Artificial Intelligence 2*	6
Project Artificial Intelligence 3*	6
Reinforcement Learning	6
Seminar Combining Symbolic and Statistical Methods in AI	6
Statistical Methods for Natural Language Semantics	6
Technology for Games	6

*See article 4.10 for requirements regarding projects.

1 The course Machine Learning 2 will consist of an adjusted version of the (original) course. This course will only be available and open for registration to master AI students (UvA) who have started the Master AI programme in September 2017 or earlier. Master AI students who will start the programme in September 2018 will have the possibility to do the course (original course) in period 1 of academic year 2019/2020.

2 The course Computer Vision 2 will consist of an adjusted version of the (original) course. This course will only be available and open for registration to master AI students (UvA) who have started the Master AI programme in September 2017 or earlier. Master AI students who will start the programme in September 2018 will have the possibility to do the course (original course) in period 2 of academic year 2019/2020.

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 Examinations Board.

Article 4.5 – Free curriculum
1. Subject to certain conditions, the student has the option of proposing 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 proposed by the student and must at least have the size, breadth and depth of a regular Master's programme and must have a clear AI character.
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 master programme Artificial Intelligence.

Article 4.6 – 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 exceptional cases an individual student can be allowed to improve the result after the course is completed.
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 4.7 – Participation in practical exercise and study group sessions
Not applicable

Article 4.8 – Maximum exemption
A maximum of 30 EC in the programme can be accumulated through granted exemptions.

Article 4.9 – 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. The results of successfully completed examinations/components are tested after 5 years on grounds of present-day scientific insights. If the acquired knowledge no longer corresponds to the present-day scientific insights and the objectives of the master programme the Examinations Board can decide that the result of a successfully completed examination has expired and therefore the validity period of the course in question has to be limited.

Article 4.10 –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 4.11 – 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 4.12 – 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 EC 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 consists 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.

5. Academic student counseling

Article 5.1   Academic student counselling
The academic student counselling for this programme consists of:
study adviser

6. Teaching evaluation

Article 6.1   Teaching evaluation
Teaching evaluation shall take place as follows:
• Course evaluations (of a large selection of courses);
• Curriculum evaluation of the degree programme
• Oral discussion.
All evaluation reports are discussed within the Programme Committee (OC). The OC advises the programme director on the quality of the degree programme.

Chapter 7. Transitional and final provisions

Article 7.1 - Amendments and periodic review
1. Any amendment to the Education and Examination Regulations will be adopted by the dean after taking advice, and if necessary approval by 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 as stated in the WHW.
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 7.2 – 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 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

Transitional Provisions for students who started in 2017-2018 or earlier

Old component	Replacement in 2018/2019	
Applied Language Technology	Deep Learning for Natural Language Technology	
Computer Intelligence (VU)	Evoltionary Computing (VU)	
Unsupervised Language Learning	Machine Learning for Natural Language Processing	

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 7.3 - 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 7.4 – Effective date
These Regulations enter into force with effect from September 1st, 2018.
Thus drawn up by the Dean of the Faculty of Science on August 28th2018.

Appendix 1   List of components provided by the study programme

Component	Code	Study load (EC)	Semester	Teaching method	Assessment
Basic Probability: Theory	53141BPC3Y	3	1		Written
Computational Semantics and Pragmatics	5314COSP6Y	6	1	L	Written, oral
Computational Social Choice	5314COSC6Y	6	2	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	2	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
Machine Learning for Natural Language Processing	5204MLFN6Y	6	1		
Master Thesis AI	5204MTA42Y	36	1 & 2	IC	Written, oral
Mathematics for AI	nnb	0	1	self-study	self-study
Multi-Agent Systems	5204MUAS6Y	6	1	L, CP	Written
Natural Language Processing 1	52041NLP6Y	6	1	L, CP	Written
Natural Language Processing 2	52042NLP6Y	6	2	L, CP	Written, oral
Probabilistic Robotics		6	1	L, CP	Written
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
Reinforcement Learning	5204RELE6Y	6	1	L, PR, CP	Written, oral
Seminar Combining Symbolic and Statistical Methods in AI	5204SCSS6Y	6	2	L	Written, oral
Statistical Methods for Natural Language Semantics	5204SMFN6Y	6	2	L, CP	Written, oral
Technology for Games	5294TEFG6Y	6	1	L, CP	Written, oral

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