

**FACULTY OF SCIENCE  
TEACHING AND EXAMINATION REGULATIONS**

**Academic year 2019 – 2020**

**MASTER'S PROGRAMME COMPUTATIONAL SCIENCE (JOINT DEGREE)  
MASTER'S PROGRAMME COMPUTATIONAL SCIENCE (SINGLE DEGREE)**

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## Part A: Faculty section

*Bookmarker:*

*In case a student decides to submit a complaint and/or appeal (against) a decision made by (e.g. a lecturer, administration or a committee) relating to the provisions stipulated in this TER, all information concerning the complaints procedure can be found on the website of the study programme.*

### 1. General provisions

#### Article A-1.1 Applicability of the Regulations

1. These Teaching and Examination Regulations (hereinafter: these Regulations) apply to the teaching and examinations for the Master's degree programmes (hereinafter referred to as: the degree programme) provided by the Faculty of Sciences (FNWI) (hereinafter referred to as: the faculty) of the University of Amsterdam(UvA):
  - Artificial Intelligence
  - Biological Sciences
  - Biomedical Sciences
  - Brain and Cognitive Sciences
  - Chemistry<sup>1</sup>
  - Computational Science<sup>1</sup>
  - Earth Sciences
  - Forensic Science
  - Information Studies
  - Life Sciences
  - Logic
  - Mathematics
  - Mathematical Physics
  - Physics and Astronomy<sup>1</sup>
  - Security and Network Engineering
  - Software Engineering
  - Stochastics and Financial Mathematics(hereinafter referred to as: the degree programme).
2. These Regulations consist of a faculty section (A) and a programme-specific section (B). Section A contains general provisions and applies to the teaching and examinations of the Master's degree programmes of the faculty. Section B contains programme-specific provisions. Together, Sections A and B form the Teaching and Examination Regulations for the programme.
3. The Regulations can be declared to apply equally to the joint degree programmes and components referred to in Section 7.3c of the Dutch Higher Education and Research Act (WHW) that are co-organised by the faculty.
4. These Regulations apply to anyone enrolled in (components of) the programme, irrespective of the academic year in which the student was first enrolled in (components of) the programme.
5. Section B of these Teaching and Examination Regulations may contain additional general provisions for the relevant degree programme.

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<sup>1</sup>This programme is provided by the Vrije Universiteit Amsterdam and the University of Amsterdam

## Article A-1.2 Definitions

The following definitions are used in these Regulations:

- a. academic year: the period beginning on 1 September and ending on 31 August of the following calendar year;
- b. Admissions Board: the committee that assesses, on behalf of the dean (UvA), whether a candidate meets the requirements for admission to the Master's degree programme of his/her choice. If there is no Admissions Board appointed for the degree programme, the Examinations Board (within the meaning of Section 7.12 of the WHW) functions as Admissions Board;
- c. COBEX: Examination Appeals Board (Dutch: College van Beroep voor de Examens);
- d. component: a unit of study of the programme assessed by means of an examination;
- e. course catalogue: the guide for the degree programme that provides the provisions and other information specific to that programme, including general information about the courses. The course catalogue is available electronically at <http://studiegids.uva.nl/> ;
- f. course manual: document that provides the details of the component-specific provisions and other component-specific information. The course manual will be made available to registered students before the start of the course;
- g. EC (European Credit): a credit with a workload of 28 hours of study;
- h. examination: an assessment of the student's knowledge, understanding and skills relating to a component. The assessment is expressed in terms of a final mark. An examination may consist of one or more interim examinations. A resit always covers the same material as the original examination. A written examination can be taken on paper or digitally;
- i. examiner: the person appointed by the Examinations Board for the purpose of holding examinations and determining their results, within the meaning of Section 7.12c of the WHW;
- j. Examinations Board: the Examinations Board of one or more study programmes of the faculty, within the meaning of Section 7.12 of the WHW;
- k. Executive Board: Dutch: College van Bestuur;
- l. final examination: the final examination of the Master's programme within the meaning of Section 7.3.3 of the WHW;
- m. interim examination: examination which covers a part of the content of a component;
- n. fraud and plagiarism: the student's acts or failures to act which make it wholly or partially impossible to accurately judge his/her knowledge, understanding and / or skills, please see the text of the [Regulations governing Fraud and Plagiarism](#);
- o. joint degree: a degree awarded by an institution together with one or more institutions in the Netherlands or abroad, after the student has completed a degree programme (a degree programme, a major or a specific curriculum within a degree programme) for which the collaborating institutions are jointly responsible;
- p. master's thesis: (a) component(s) consist(s) of literature research and / or a contribution to scientific research, always resulting in a written report;
- q. period: a part of a semester;
- r. practical exercise: the participation in a practical training or other educational learning activity, aimed at acquiring certain (academic) skills. Examples of practical exercises are:
  - researching and writing a thesis or literature review;
  - carrying out a research assignment;
  - taking part in fieldwork or an excursion;

- taking part in another educational learning activity aimed at acquiring specific skills;
  - participating in and completing a work placement (internship) or research project;
  - preparing an assignment, paper, project or prototype;
  - conducting a design or research assignment;
  - conducting a literature review;
  - conducting assignments independently;
  - carrying out practical work;
  - conducting tests and experiments.
- s. programme the totality and cohesion of the course components, teaching activities / methods, contact hours, testing and examination methods and recommended literature;
- t. semester the first (September – January) or second (February – August) half of an academic year;
- u. SIS: the Student Information System of the UvA;
- v. thesis: a component comprising literature research and/or a contribution to scientific research, always resulting in a written report;
- w. university the University of Amsterdam;
- x. workload the workload of the components to which an interim examination applies, expressed in terms of credits = EC. (The workload for 1 year (1,680 hours) is 60 EC);
- y. WHW the Dutch Higher Education and Research Act (Wet op het hoger onderwijs en wetenschappelijk onderzoek, WHW). The other terms have the meanings ascribed to them by the WHW.

## 2. Previous education and admission

### Article A-2.1 Previous education

1. In order to qualify for enrolment in a Master's degree programme, a Bachelor's degree obtained in academic higher education (WO) is required. The requirements that the Bachelor's degree must meet are specified in section B.
2. In the event that a candidate does not have a Bachelor's degree as referred to in paragraph 1, the Admissions Board of the degree programme will assess suitability for admission to the programme on the basis of the requirements stipulated in section B.
3. In order to qualify for enrolment in a Master's degree programme for teaching in pre-university education, the individual concerned must have been awarded the Master's degree in the relevant subject area, pursuant to Section 7.10a of the WHW.

### Article A-2.2 Registration and enrolment

1. The deadline for registering for the Master's programme is stipulated in Article B-3.4 of section B.
2. After registering on time, the student must enrol before 1 September or, if applicable, before 1 February.

### Article A-2.3 Faculty Admissions Board

The dean will establish one or more Admissions Boards. The dean will appoint its members after consultation with the programme directors and Examinations Boards of the relevant degree programmes.

### Article A-2.4 Admissions procedure

1. The Admissions Board is responsible for admission to the programme.
2. With a view to admitting students to the programme, the Admissions Board assesses the candidate's knowledge, understanding and skills. The Board may request experts within or outside the University to test certain types of knowledge, understanding and skills, in order to supplement written evidence of the programme/programmes the student has already completed. In its assessment, the Board includes knowledge of the language in which the programme will be taught.

3. Candidates receive either confirmation of admission or a negative decision with substantiation. An appeal against a negative decision can be lodged with the Examination Appeals Board (COBEX) within six weeks. The candidate shall be informed of the option to appeal to the Examinations Appeals Board.

#### **Article A-2.5 Refusal or termination of enrolment (*unsuitability/iudicium abeundi*)**

1. Based on the provisions of Section 7.42a of the WHW, the dean or the Examinations Board may, in exceptional cases, ask the Executive Board to terminate or refuse a student's enrolment in a programme, if that student's actions or remarks show that he/she is unsuitable either for practising one or more of the professions for which the programme in question is preparing the student or for the practical preparation for professional practice.
2. If a student is suspected of being unsuitable as described in paragraph 1, the Examinations Board or the dean will institute an inquiry, of which the student will be informed immediately. The Examinations Board or the dean will not issue any recommendation without carefully considering the interests involved and giving the student the opportunity to be heard.

### **3. Degree programme structure**

#### **Article A-3.1 Structure of academic year**

1. The degree programme shall be provided in a semester structure as outlined in the Decision on the Academic Calendar.

#### **Article A-3.2 Organisation of the programme**

1. The programme comprises the components included in section B.
2. The size of the degree programme in EC is stipulated in section B.
3. The programme is made up of a compulsory part and a Master's Thesis, academic work placement (internship) or research project and, if applicable, a subject-specific optional component as specified in more detail in section B.
4. The compulsory attendance of a component of an educational programme is laid down in the course catalogue or course manual. Compulsory components may be stipulated in section B.
5. Further conditions with regard to registration for participation in a component, if applicable, are described in section B.

### **4. Examinations**

#### **Article A-4.1 Signing up for programme components and examinations**

1. Every student must sign up to participate in components in the Master's programme, if registration is required for participation. Signing up may only take place in the designated periods. The procedure for signing up is described in the course catalogue. Participation in the examination may be refused if the student does not sign up.
2. By way of exception to the provisions of paragraph 1, any student who has correctly signed up for participation in the instruction/classes for a particular course and has been admitted will also be signed up for the subsequent examination and, where applicable, the resit, unless stipulated otherwise in section B.
3. If a student does not pass the examination and the resit of a component, he/she is obliged to take the whole component again.
4. In addition to paragraph 3: This provision does not apply for a number of degree programmes in which certain marks remain valid (which implies that certain educational components need not be followed again). For which exams this applies is described in section B of the degree programme.
5. If a student decides to quit the course, the student must withdraw for the component via SIS.
6. Every student has the right to participate in all programme(s) provided by the university where he/she is registered, on condition that he/she meets the requirements for previous education, entry qualification(s) for a component concerned, and there is no limited programme capacity for the component concerned.

#### **Article A-4.2 Type of examination**

1. Section B stipulates the way in which a component is concluded and the form any examination will take.
2. At the student's motivated request or at the examiner request with approval from the student, the Examinations Board may permit a different form of examination than that stipulated in the course catalogue. If applicable, more detailed regulations on this are included in the Rules and Guidelines for the Examinations Board.
3. Where a component is no longer offered, Section B will include a transitional arrangement.
4. The remaining procedures for examinations and the guidelines and instructions for the assessment and determination of test and examination results are described in the Rules and Guidelines of the Examinations Board.
5. In the case of components including a written examination, the student will be entitled to receive sample questions and information about the actual written examination in form and level, preferably in the form of an example examination.

#### **Article A-4.3 Oral examinations**

1. Unless otherwise specified for the relevant component in section B, no more than one student will be examined orally at the same time.
2. An oral (interim) examination is public unless the Examinations Board determines otherwise in an exceptional case. A student may submit a reasoned request to the Examinations Board to depart from the public nature of the oral examination. The Examinations Board will balance the interests of the student against the interests of a public examination.
3. An oral examination will be taken in the presence of a second examiner or an audio recording will be made of the examination.

#### **Article A-4.4 Determining and announcing results**

1. The examiner determines the result (= mark) of a written examination as soon as possible, but at the latest within fifteen working days. Contrary to the provisions of the first sentence, the marking deadline for theses and final assignments as research projects is no longer than twenty working days.  
The examiner submits the necessary information to the Programme Administration and the Programme Administration will then immediately ensure that the marks are registered. The Programme Administration also ensures that the student is notified of the mark within five working days, taking due account of the applicable confidentiality standards. The examiner does not publish results for which the grades are traceable to the individual student.
2. The examiner determines the result (=mark) of an interim examination in any event no later than ten working days after the interim examination has been held.
3. The examiner determines the result of an interim examination no later than five working days before the next (interim) examination will be held.
4. In case of a conflict paragraph 3 prevails over paragraph 2.
5. The examiner determines the result (= mark) of an oral examination within a day the examination has finished and informs the student accordingly. The third sentence of the first paragraph applies.
6. In the case of alternative forms of oral or written examinations, the Examinations Board determines in advance how and by what deadline the student will be informed of the results, however, this deadline shall not be longer than twenty working days.
7. Together with the result of an examination, the student's attention will also be drawn to their right to inspect the assessed work and have a post-examination discussion as stipulated in Articles A-4.9 and A-4.10, as well as his/her option to appeal to the Examinations Appeals Board (Cobex).
8. A student may lodge an appeal against the way in which the result was reached with the Examination Appeals Board within six weeks of the announcement of the result. A request for reassessment can also be submitted to the examiner. A request for reassessment does not suspend the term for the appeal.

#### **Article A-4.5 Resits**

1. An opportunity will be offered to resit examinations in the degree programme once in each academic year.
2. Paragraph 1 does not apply in the case of a fail for a practical exercise, a work placement (internship), a research project or a thesis. The options for retaking work placements and theses are detailed in the relevant work placement manual or thesis regulations, or in section B.
3. The most recent mark will apply in the event of a resit.



4. The resit for an examination must not take place within ten working days of the announcement of the result of the examination being resat, unless this is otherwise regulated for specific components in section B.
5. Further conditions with regard to resits are included in section B, where applicable.

#### Article A-4.6 Marks

1. Marks are given on a scale from 1 to 10. Marks are given with a maximum of one decimal after the point.
2. For final marks only decimals 0 or 5 can be given.
3. The final marks between 5 and 6 (5.5) cannot be given.
4. In cases where the final mark is a weighted average, the final mark is calculated with marks of one decimal after the point.
5. Any final mark of 6.0 or higher counts as passed.
6. In cases where the examination of a component consists of two or more parts, each of which are graded separately, the (weighted) mean of these marks (meaning: the final mark) must be rounded off using the following table:

From	Up to	Grade
1,00	1,25	1
1,25	1,75	1,5
1,75	2,25	2,0
2,25	2,75	2,5
2,75	3,25	3,0
3,25	3,75	3,5
3,75	4,25	4,0
4,25	4,75	4,5
4,75	5,50	5,0
5,50	6,25	6,0
6,25	6,75	6,5
6,75	7,25	7,0
7,25	7,75	7,5
7,75	8,25	8,0
8,25	8,75	8,5
8,75	9,25	9,0
9,25	9,75	9,5
9,75	10,0	10

7. Contrary to the provisions of paragraph 1 till 5 of this Article, a component may be concluded with the 'pass' designation. (In Dutch: aan voorwaarden voldaan, AVV). The names of the relevant components can be found in section B of these Regulations, if applicable.
8. When a student hasn't signed out for a component and hasn't taken the examination or participated in another type of assessment, a no show will be registered.

#### Article A-4.7 Exemption

1. At the written request of the student, the Examinations Board may exempt the student from taking one or more components, if the student:
  - a. has passed a component at a university or higher professional education programme that is equivalent in both content and level; or
  - b. has demonstrated through his/her work and/or professional experience that he/she has sufficient knowledge and skills with regard to the relevant component.
  - c. Has indicated having conscientious objections.; the Examinations Board decides which requirements must be met.
2. This exemption does not apply to the Master's thesis, the final work placement (internship) or the final research project (in case of programmes where the research project results in the final paper).
3. The Examinations Board will make a decision within twenty working days of receiving the written request.

#### **Article A-4.8 Validity period for results**

1. The dean may decide to limit the period of validity of an examination and granted exemption, if knowledge, understanding and skills are evidently becoming obsolete.
2. In the programme-specific section (Part B) the period of validity of an examination and granted exemption is laid down.
3. Contrary to the rule referred to in paragraph 1, the Examinations Board may extend the limited validity of an examination or exemption, if a student submits a substantiated request to this end.
4. The period of validity of an interim examination is limited to the academic year in which it is taken, or until the conclusion of the component, unless stated otherwise in section B.

#### **Article A-4.9 Right of inspection**

1. For twenty working days after the announcement of the results of a written examination, the student can, on request, inspect his/her assessed work, the questions and assignments set, as well as the standards applied for marking. During this inspection the student may take a picture of his/her assessed work provided that the underlying questions are not listed / in the picture.
2. The Examiner can determine that the inspection or post-examination discussion referred to in paragraph 1 take place exclusively at a specified place and at a specified time. The place and time referred to in the previous clause will be announced at the time of the examination and on the digital learning environment (CANVAS).
3. If the student was unable to attend at the place and time referred to in paragraph 2 through no fault of his/her own, an alternative option will be offered.
4. If a student intends to appeal against the way in which his/her mark was assessed, he/she can be issued with a copy of the marked work at his/her request.

#### **Article A-4.10 Post-examination discussion**

1. The examiner can organize a post-examination discussion. In this discussion, the examiner deals with the questions of the examination.
2. If a collective post-examination discussion has been organised, individual post-examination discussions will be held only if the student has attended the collective discussion or if he/she was unable to attend the collective discussion through no fault of his/her own.
3. Students who meet the requirements stipulated in the second paragraph can submit a request for an individual post-examination discussion to the relevant examiner. The discussion will take place at a time and location to be determined by the examiner in consultation with the student.

#### **Article A-4.11 Master's final examination**

1. The Examinations Board determines the final examination result and the date on which the student obtains his/her degree after it has been established that the student has passed all the components belonging to the programme.
2. A diploma can only be awarded after the Executive Board has declared that the student has satisfied all the procedural requirements, including payment of tuition fees.
3. The rules for conferring the designation of cum laude are set out in the Rules and Guidelines of the Examinations Board.

#### **Article A-4.12 Diplomas and transcripts**

1. The Examinations Board grants a diploma as proof that the student has passed his/her final examination. The guidelines for a degree classification (judicium) are listed in the Rules and Regulations of the Examinations Board. The Executive Board sets the model for the diploma. The Examinations Board adds a diploma supplement to the diploma providing information on the nature and content of the degree programme completed. The diploma supplement is drawn up in English and complies with the European format.
2. Individuals who have successfully completed more than one component of the programme and who cannot be awarded a diploma as stipulated in paragraph 1 will, on request, receive a statement to be issued by the relevant Examinations Board stating at least the components that have been successfully completed together with the components they involved, the number of EC obtained and the way in which the examinations were taken.
3. The student can, without needing to provide reasons, request that the Examinations Board not proceed to award a diploma, unless the student him-/herself submitted the request for its issue.

#### **Article A-4.13 Fraud and plagiarism**

1. The provisions of the Regulations governing Fraud and Plagiarism for UvA Students (and additions in the Rules and Guidelines for the Examinations Board) apply in full.
2. Electronic detection software programs may be used to detect plagiarism in texts. In submitting a text, the student implicitly consents to the text being entered into the database of the detection program concerned.

### **5. Study supervision and study progress**

#### **Article A-5.1 Administration of study progress and academic student counselling**

1. The dean is responsible for the correct registration of the students' study results in SIS. After the assessment of an examination component has been registered, every student has the right to inspect the result for that component via SIS and also has a list of the results achieved at his/her disposal in SIS.
2. Enrolled students are eligible for academic student counselling. The types of academic student counselling available are described in section B.

#### **Article A-5.2 Adaptations for students with a disability**

1. A student with a disability can qualify for special adaptations with regard to teaching, practical training and interim examinations. Therefore the student should receive a recommendation provided by a student counsellor. These adaptations will accommodate the student's individual disability as much as possible, but may not alter the quality or degree of difficulty of a course or an examination. In all cases, the student must fulfil the exit qualifications for the degree programme.
2. The request referred to in the first paragraph must in part be based on a recent statement from a physician or psychologist. In case of dyslexia a (written) statement is required, provided by The Dutch Association of Psychologists (in Dutch: NIP), BIG-, and/or certified Association of Educationalists-agency (in Dutch: NVO). In the case of a chronic disability the foregoing recommendation need only be provided once.
3. The dean or, on its behalf, the College/Graduate School director or the education programme director decides on the adaptations concerning the teaching facilities and logistics. The Examinations Board will rule on requests for adaptations with regard to examinations.
4. A request for adaptations will be rejected if it would place a disproportionate burden on the organisation or the resources of the faculty or university were it to be upheld.
5. In the event of a positive decision in response to a request as referred to in paragraph 1, the student will make an appointment with the study adviser to discuss the details of the provisions.
6. If the disability justifies an extension to the exam time, and/or other facilities the student counsellor will issue a statement testifying to this entitlement to an extension and/or facility.
7. The statement referred to in paragraph 6 is valid the whole period of study.

### **6. Teaching evaluation**

#### **Article A-6.1 Teaching evaluation**

The teaching evaluation will take place in the manner determined in section B.

### **7. Hardship clause**

#### **Article A-7.1 Hardship clause**

In instances not regulated by the Teaching and Examination Regulations or in the event of demonstrable extreme unreasonableness and unfairness the dean responsible for the degree programme will decide, unless the matter concerned is the responsibility of the Examinations Board.

#### **Artikel A-7.2 Calamity**

The educational programme director attempts to limit possible negative effects on study progress of a student(s) as a consequence of calamity.

## 8. Transitional and final provisions

### Article A-8.1 Amendments and periodic review

1. Amendments to section A of the Teaching and Examination Regulations will be adopted by the dean with due observance of the regulations pursuant to Section 9.5 of the WHW, as adopted by the Executive Board in relation to section A, and with due observance of the relevant authorities of the representative advisory bodies.
2. An amendment to the section A of the Teaching and Examination Regulations can only pertain to an academic year that is already in progress if this does not demonstrably damage the interests of students.

### Article A-8.2 Transitional provisions

1. Contrary to the provisions of the applicable Teaching and Examination Regulations, students who started their degree programmes under previous Teaching and Examination Regulations will be subject to the transitional arrangements outlined in Section B.

### Article A-8.3 Publication

1. The dean will ensure the appropriate publication of sections A and B of these Regulations and any amendments to them.
2. The Teaching and Examination Regulations will be posted on the Faculty website.

### Article A-8.4 Entry into force

Section A of these Regulations enter into force with effect from 1 September 2019.

Adopted by the dean on 27 August 27 2019.

Approved by authorised representative advisory body:

- Faculty Student Council, dd July 4<sup>th</sup> 2019;
- Artificial Intelligence, dd July 15<sup>th</sup> 2019;
- Biological Sciences, dd July 1<sup>st</sup> 2019;
- Biomedical Sciences, dd July 8<sup>th</sup> 2019;
- Brain and Cognitive Science, dd July 1<sup>st</sup> 2019;
- Chemistry, dd June 27<sup>th</sup> 2019;
- Computational Sciences, dd July 8<sup>th</sup> 2019 ;
- Earth Sciences, dd July 2<sup>nd</sup> 2019;
- Forensic Sciences, dd June 28<sup>th</sup> 2019;
- Information Studies, dd July 6<sup>th</sup> 2019;
- Logic, dd July 9<sup>th</sup> 2019;
- Mathematics, Mathematical Physics & Stochastic and Financial Mathematics, dd July 9<sup>th</sup> 2019;
- Physics and Astronomy, dd July 5<sup>th</sup> 2019;
- Software Engineering & System and Network Engineering, dd July 16<sup>th</sup> 2019.

## **Part B: Programme specifics**

### **Chapter 1. General Provisions**

#### **Article B-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 B-1.2 – Study programme information**

1. The Master's programme Computational Science, CROHO number 65015 (joint degree) and CROHO number 60299 (single degree), 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/about-the-university/rules-and-regulations/teaching/teaching.html> ).
2. The programme consists of a two-year programme with a total study load of 120EC.
3. A standard curriculum contains components offered by the Master's programme and the Master's Thesis. Students are required to have their personalised curriculum approved by the Examinations Board prior to graduation. Any subsequent changes in the student's personalized curriculum must again be approved by the Examinations Board. The ultimate requirement is that the approved personal curriculum should match the curriculum actually followed by the student.

#### **Article B-1.3 – Enrolment**

The programme is offered starting in the first semester of the academic year (1 September).

### **Chapter 2. Programme objectives and exit qualifications**

#### **Article B-2.1 – Programme objectives**

The objectives of the Master Computational Science programme at the University of Amsterdam are as follows:

1. To educate students at an academic level to the degree of Master of Science in Computational Science, in order to become active members of the scientific research community in academic institutions as well as in advanced research and development environments.
2. To attain a final level of knowledge and academic skills that will grant access to PhD programmes in the Computational Sciences or to other scientific research-oriented positions.

#### **Article B-2.2 – Exit qualifications**

The exit qualifications of the Master's Programme Computational Science are defined as follows:

1. The graduate in Computational Science has a thorough knowledge of modelling and simulation of complex systems, computational methods and techniques and the application of computational methodologies in application fields (ranging from e.g. physics or biology to medical sciences or psychology).
2. The graduate is able to contribute to scientific research in the field of the degree course.
3. The graduate can formulate and solve problems with the aid of abstraction and modelforming.
4. The graduate is able to formulate problems both in general terms and in mathematical and technical terms.
5. The graduate is able to clearly express himself/herself both orally and in writing.
6. The graduate is able to analyse, design and implement as part of a team.
7. The graduate has given thought to the social context of the exercise of science in general and the application of computer science in particular.
8. The graduate is able to independently acquire the information and concepts that are necessary when starting up a new project.

### **Chapter 3. Further admission requirements**

#### **Article B-3.1 – Admission requirements**

Admission to the Master's Programme in Computational Science is granted by the Admissions Board. All students holding an academic Bachelor degree in one of the Sciences or Engineering disciplines may apply for the master. Candidates for the programme should demonstrate sufficient knowledge in mathematics and computing skills and meet with the following requirements before they will be admitted to the programme: basic programming (any language), basic math knowledge in calculus and basic knowledge in probability theory and statistics.

Once accepted into the programme, an acceptance interview will be held with each student so as to identify strengths and weaknesses and help tailor the student's curriculum.

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

1. The Admissions Board may decide that a holder of an academic bachelor's degree, who does not meet the admissions requirements, as stated in article B-3.1., will have to complete a pre-master's programme of maximum 30 EC in order to have admission to the master's programme Computational Science. .
2. The Minor programme Computational Science consists of 30 ECTS and acts as a formal pre-Master's programme for the Master's programme Computational Science. The Minor programme Computational Science is intended for non-computing students and will train these students in mathematics and programming in preparation of the Master's programme. The Minor programme runs from September to January and consists of courses taught in the Dutch language. Therefore, students are required to understand the Dutch language.
3. Students who are able to complete the Minor Programme successfully will receive confirmation of admission to the Master's programme in the subsequent academic year.

#### **Article B-3.3 – Limited programme capacity**

Not applicable.

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

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

#### **Article B-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: 6,5, at least 6 on each sub-score (listening/reading/writing/speaking);
  - b. TOEFL paper-based: 580; paper-delivered at least 22 on each sub-score;
  - c. TOEFL Internet-based test: 92, at least 22 on each sub-score (listening/reading/writing/speaking);The foregoing examination must have been taken within two years before the student's enrolment.
  - d. C1 Advanced (CAE): minimal result 170 (overall C); ;
  - e. C2 Proficiency (CPE): minimal result 170 (overall C)Please note that the TOEFL-code for the Faculty of Science of the University of Amsterdam is 9011 .
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 B-4.1 – Composition of programme

1. The curriculum comprises the following:
  1. Compulsory core components: 66 EC (24 EC on core courses in year 1 and 42 EC on the Master Thesis Computational Science of 42 EC in year 2);
  2. Restricted-choice elective components: 30 EC;
  3. Free-choice elective components : 24 EC. Free-choice elective components will be chosen with the consent of the Examinations Board.
2. A complete list of components provided by the Master's programme can be found in Appendix1.
3. Every component will be tested. Within the Master's programme Computational Science different forms of testing are used. This is described per component in the course catalogue.
4. Within the Master's programme Computational Science different types of teaching methods are used. This is described per component in the course catalogue.

### Article B-4.2 – Compulsory components

Core Courses	
Year 1	24 EC required
<i>All these components:</i>	
Complex System Simulation (UvA)	6
Introduction to Computational Science (UvA)*	6
* Students with sufficient prior knowledge can replace this component with an additional constrained choice component.	
Numerical Algorithms (UvA)	6
Seminars Computational Science (UvA)	6
Year 2	42 EC required
Master Thesis Computational Science (UvA)	42

Restricted-Choice Elective Courses	
As available/offered	30 EC required
Agent-based modelling (UvA)	6
Biosystems Data Analysis (UvA)	6
Computational Biology (UvA)	6
Computational Finance (UvA)	6
Data Mining Techniques (VU)	6
Distributed Algorithms (VU)	6
Evolutionary Computing (VU)	6
Experimental Design and Data Analysis (VU)	6
Introduction to Systems Biology (VU)	6
Large-scale Data Engineering (VU)	6
Performance of Networked Systems (VU)	6
Programming Large-scale Parallel Systems	6
Scientific Computing (UvA)	6
Stochastic Simulation (UvA)	6

### Article B-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 A-1.2 of part A.

### Article B-4.4 – Free-choice elective components

1. Free-choice elective courses can be chosen from the lists of free-choice elective courses below. Please note that these lists are only examples of some of the possible free-choice electives. These are not exhaustive lists, and students are free to find other application domains and related courses, or find other courses in the already listed domains.
2. Course choices within an application domain should be made in consultation with the Programme Director or Thesis supervisor.

Free-Choice Elective Courses	24 EC required
<b>Application domain Computational Science Core:</b> <ul style="list-style-type: none"><li>- Behaviour Dynamics in Social Networks (VU)</li><li>- Experimental Design and Data Analysis (VU)</li><li>- Information Theory (UvA)</li><li>- Internet Programming (VU)</li><li>- Knowledge Representation on the Web (VU)</li><li>- Machine Learning 1</li><li>- Machine Learning for the Quantified Self (VU)</li><li>-</li><li>- The Social Web (VU)</li></ul>	6 6 6 6 6 6 6 6
<b>Application domain Computational Finance/Economics:</b> <ul style="list-style-type: none"><li>- Advanced Topics in Computational Finance (UvA)</li><li>- Bounded Rationality (UvA)</li><li>- Non-linear Economic Dynamics (UvA)</li><li>- Quantitative Financial Risk Management (VU)</li><li>- Stochastic Calculus (UvA)</li><li>-</li></ul>	6 5 5 6 5
<b>Application domain Computational Biology:</b> <ul style="list-style-type: none"><li>- Algorithms in Sequence Analysis (VU)</li><li>- Bioinformatics I (UvA)</li><li>- Bioinformatics II (UvA)</li><li>- Bioinformatics for Translational Medicine (VU)</li><li>- Fundamentals of Bioinformatics (VU)</li></ul>	6 6 6 6 6
<b>Application domain Computational Biomedicine:</b> <ul style="list-style-type: none"><li>- Biomedical Modelling and Simulation (VU)</li><li>-</li><li>- Parameter Estimation Applied to Medical and Biological Sciences (VU)</li><li>- Physics of Organs 1: Cardio-Pulmonary Physics (UvA)</li></ul>	6 6 6
<b>Application domain Computational Chemistry:</b> <ul style="list-style-type: none"><li>- Biomolecular Simulations (UvA)</li><li>- Statistical Theory of Complex Molecular Systems (UvA)</li><li>- Understanding Molecular Simulation (UvA)</li></ul>	6 6 6



<b>Application domain High Performance Computing:</b> - Concurrency and Multithreading (VU) - Distributed Systems (VU)	6 6
<b>Application domain Computational Earth Sciences:</b> <i>(course choices in consultation with the specialisation coordinator)</i>	
<b>Application domain Scientific Computing, Numerical Math:</b> <i>(course choices in consultation with the specialisation coordinator)</i>	

3. An free-choice elective component will only be seen as part of the programme if the Examinations Board has given its prior approval.
4. In terms of content, free-choice elective components must not show significant overlap with other components of the student's curriculum. The acceptable degree of overlap will be decided by the Examinations Board.
5. The Examinations Board may permit the choice of one or more components from other university-level Master Programmes. Approval must be obtained prior to enrolling on external courses.

#### **Article B-4.5 – Free curriculum**

1. Subject to approval, and only in exceptional cases, 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 concrete details of such a curriculum must be approved beforehand by the Examinations Board of the master's programme.
3. The following conditions must at least be met in order for a student to be eligible for the master's degree:
  1. all compulsory components should be part of the student's programme;
  2. The free curriculum must at least have the size, breadth and depth of a regular Master's programme and must match the exit qualifications that apply for the Master's programme Computational Science.

#### **Article B-4.6 – Sequence of examinations**

1. The student may start with the final project of the study programme (Master Thesis) only if all other compulsory components have been completed and the student has completed all necessary restricted-choice courses (30 EC). The student's final study programme must also have been approved by the Examinations Board.
2. In case one or more courses are still to be completed, the programme director and thesis supervisor may agree that the student in question may start with the Graduation Research project.
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.

#### **Article B-4.7 – Participation in practical exercise and study group sessions**

Not applicable.

#### **Article B-4.8 – Maximum exemption**

1. A student may apply to the Examinations Board for the approval of transfer credits for components taken in a different programme, provided those components have not been used towards a degree at a different university. This is only possible for components at Master's level that are directly relevant to the Master Computational Science programme and only in case there is no overlap with other components taken by the student. By default, all transfer credits are registered with an exemption and will not be taken into account to compute the student's grade point average.
2. At most 36 EC of the student's programme can consist of such transfer credits.
3. For recognized double degree programmes e.g. ITMO this limit is determined by the agreement in question and may exceed the 36 EC.
4. Components successfully completed elsewhere during the programme may supplement the student's examination programme, subject to permission from the Examinations Board.

#### **Article B-4.9 – Validity period of examinations**

1. The validity period of successfully completed (interim) examinations and granted exemptions can be limited as described in article A-4.8 of part A (2019-2020 ). 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.
2. In addition to paragraph 4 of article A-4.8 of part A (2019-2020 ) results of interim examinations which include theoretical course material are valid throughout the period of the course in question. Results of practical examinations are valid up to and including the end of the academic year in which they were achieved.

#### **Article B-4.10 – Marks**

1. The master thesis research project is subject to a penalty system in order to encourage students to finish their master thesis research project within the standard, expected time of 7 months (42 ETCS). Students are expected to finish their master thesis research project within the time limit of 7 months plus a 2-month grace period (a total of 9 months). The final grade of a student who takes longer than these 9 months to finish his or her project will be subjected to a penalty. Any student who takes longer than 9 months receives a half-point deduction for every extra month taken, up to a maximum of 2 points (4 months). Students are allowed to formally ask for an extension or suspension of their master thesis research project in case of good reasons for extension or suspension. These requests (and motivations) must be approved by the Examinations Board and the student in question must have discussed the reasons with the study advisor before asking for an extension..

#### **Article B-4.11 – 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 B-4.12 – Individual project**

1. An individual project may replace a free-choice elective component.
2. For that purpose the student will prepare both a subject description including the aim and content of the project, as well as the intended deliverable for assessment. The student has to find an examiner for the project as well as a daily supervisor).
3. A project may amount to a maximum of 12 EC.
4. The total of individual projects should not be more than 12 EC.
5. Participation in a summer school may also be regarded as a project. The amount of EC that can be credited depends upon the amount of teaching conducted during the school.
6. The prior approval of the Examinations Board is required for an individual project to be included in the student's study programme.

## **Chapter 5. Academic student counselling**

### **Article B-5.1 Academic student counselling**

The academic student counseling for this programme consists of:  
study adviser and tutors

## **Chapter 6. Teaching evaluation**

### **Article B-6.1 Teaching evaluation**

Teaching evaluation shall take place as follows:

- Course evaluations (of all courses of the master programme Computational Science);
- 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 B-7.1 - Amendments and periodic review**

1. Any amendment to the Teaching and Examination Regulations will be adopted by the dean after taking advice, and if necessary approval by the relevant Programme Committee. A copy of the advice will be sent to the authorised representative advisory body.
2. An amendment to the Teaching and Examination Regulations requires the approval of the authorised representative advisory body as stated in the WHW.
3. An amendment to the Teaching and Examination Regulations is only permitted to concern an academic year already in progress if this demonstrably does not damage the interests of students.

### **Article B-7.2 – Transitional provisions**

If the curriculum changes, the new curriculum and regulations also apply to students already enrolled. Students can however request the Examinations Board to have the curriculum as it was when they started their studies apply to them. If the student is enrolled (over two or more years) during a change in the curriculum, concerning core courses or constrained courses, the student is allowed to choose constrained choice and core courses from any of the valid curricula.

### **Article B-7.3 - Publication**

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

### **Article B-7.4 – Effective date**

These Regulations enter into force with effect from 1 September, 2019 .  
Thus, drawn up by the Dean of the Faculty of Science on 27 August, 2019.

## Appendix 1 List of components of the study programme

Component	Code	Study load (EC)	Semester	Teaching method	Assessment
Advanced Topics in Computational Finance (UvA)	5284COFA6Y	6	2	IC	Written, oral
Agent-based Modelling (UvA)	5284AGBM6Y	6	1	L, PR	Written
Algorithms in Sequence Analysis (VU)	5304AISA6Y	6	1	L, PR	Written
Behaviour Dynamics in Social Networks (VU)	52848BDI6Y	6	1	L, PR	Written
Bioinformatics for Translational Medicine (VU)	5304BFTM6Y	6	2	L, PR	Written, oral
Bioinformatics I (UvA)	52841BIO6Y	6	1	IC	Written, oral
Bioinformatics II (UvA)	52842BIO6Y	6	2	IC	Written, oral
Biomedical Modelling and Simulation (VU)	53548BIM6Y	6	1	L, PR	Written, oral
Biomolecular Simulations (UvA)	5254BISI6Y	6	2	L, CP	Written
Biosystems Data Analysis (UvA)	5304BIDA6Y	6	1	L, CP	Written
Bounded Rationality (UvA)	6414M0004Y	5	?	L, CP	Written, oral
Complex System Simulation (UvA)	5284COSS6Y	6	2	L, GP	Written, oral
Computational Biology (UvA)	5284COBI6Y	6	2	L, CP	Written
Computational Finance (UvA)	5204COFI6Y	6	2	L, CP	Written
Concurrency and Multithreading (VU)	52848COM6Y	6	1	L, PR	Written
Data Mining Techniques (VU)	52848DAM6Y	6	2	L, PR, GP	Written
Distributed Systems (VU)	52848DIS6Y	6	1	L, PR	Written
Evolutionary Computing (VU)	52848EVC6Y	6	1	L	Written
Experimental Design and Data Analysis (VU)	52848EDD6Y	6	2	L, CP	Written
Fundamentals of Bioinformatics (VU)	53048FUB6Y	6	1	L, CP	Written
Master Thesis Computational Science (UvA)	5284MTC42Y	42	1&2	IC	Written, oral
Information Theory (UvA)	5314INTH6Y	6	1	L, PR	Written
Internet Programming (VU)	52848INP6Y	6	1	L	Written
Introduction to Computational Science (UvA)	5284ITCS6Y	6	1	L, PR, CP	Written, oral
Introduction to Systems Biology (VU)	5304ITSB6Y	6	1	L, CP	Written
Knowledge Representation on the Web (VU)	5204KROT6Y	6	2	L, PR	Written
Large-scale Data Engineering (VU)	52848LSD6Y	6	1	L, CP	Written, oral
Machine Learning 1	52041MAL6Y	6	1	L, CP, PR	Written
Machine Learning for the Quantified Self (VU)	52848MLF6Y	6	2	L, PR	Written
Non-linear Economic Dynamics (UvA)	6414M0012Y	5	?	L, PR, CP	Written
Numerical Algorithms (UvA)	5284NUAL6Y	6	1	L, CP	Written
Parallel Programming Practical (VU)	52848PPP6Y	6	1	PR	Written
Parameter Estimation Applied to Medical and Biological Sciences (VU)	53548PEM6Y	6	2	L	Written
Performance of Networked Systems (VU)	52848PEN6Y	6	2	L	Written
Physics of Organs 1: Cardio-Pulmonary Physics (UvA)	53541PHO6Y	6	1	PR, GP	Written, oral
Quantitative Financial Risk Management (VU)	52848QFR6Y	6	2	L	Written
Scientific Computing (UvA)	5284SCCO6Y	6	2	L, CP	Written
Seminars Computational Science (UvA)	5284SECS6Y	6	1+2	L, PR	
Statistical Theory of Complex Molecular Systems (UvA)	5254STTC6Y	6	1	L, PR	Written
Stochastic Calculus (UvA)	6414M0013Y	5		L, CP, GP	Written
Stochastic Simulation (UvA)	5284STSI6Y	6	1	L, CP	Written
The Social Web (VU)	52948THS6Y	6	2	L, PR	Written

Understanding Molecular Simulation (UvA)	5254UNMS6Y	6	1	L, CP	Written
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L = Lectures, CP = Computer practical, PR = practical, IC = Individual coaching, GP = Group project