# Teaching and Examination Regulations

## Faculty of Science
## Master's programme in Computer Science (JD)

## Academic year 2024-2025

A. Faculty section
B1. Programme specific section – general provisions
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# Section A: Faculty section

## 1. General provisions

### Article 1.1 Applicability of the Regulations

| | |
|---|---|
| 1. These Regulations apply to anyone enrolled in the programme, irrespective of the academic year in which the student was first enrolled in the programme. | Advice OLC, approval FGV (9.38 sub b) |
| 2. These Regulations enter into force on 1 September 2024. | Advice OLC, approval FGV (9.38 sub b) |
| 3. An amendment to the Teaching and Examination Regulations is only permitted to concern an academic year already in progress if this does not demonstrably damage the interests of students. | Advice OLC, approval FGV (9.38 sub b) |

### Article 1.2 Definitions

The following definitions are used in these Regulations (*in alphabetical order*):

| | | |
|---|---|---|
| a. | academic year: | the period beginning on 1 September and ending on 31 August of the following calendar year; |
| b. | EC (European Credit): | a course credit with a workload of 28 hours of study; |
| c. | examination: | an assessment of the student's knowledge, understanding and skills relating to a unit of education. The assessment is expressed in terms of a final mark. An examination may consist of one or more partial examinations. A resit always covers the same material as the original examination. An examination can be completed in writing, orally or in another way; |
| d. | exemption: | exemption from an examination/practical/fieldwork based on an earlier successfully completed examination, or knowledge/skills of a similar content, level and scope gained outside higher education; |
| e. | final examination | a master's programme consists of a master's examination; |
| f. | internship | period spent working in professional practice as part of a study programme; |
| g. | 1. 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 study programme (a degree programme, a major or a specific curriculum within a degree programme) for which the collaborating institutions are jointly responsible; |
| | 2. double degree: | partnership between two study programmes, either within the institution or with another educational institution inside or outside the Netherlands, whereby students complete all or part of both study programmes and obtain two diplomas on the basis of agreements regarding the mutual recognition of the programme (replacement courses); |
| h. | minor: | a set of thematically related units of education totalling 30 credits. Students choose a minor in order to broaden and/or deepen their studies (within the scope for electives) during the Bachelor's programme; |
| i. | period: | a part of a semester; |

| | | |
|---|---|---|
| j. | practical exercise: | the participation in a practical training or other educational learning activity, aimed at acquiring certain (academic) skills. Examples of practical exercises are:<br>• researching and writing a thesis or dissertation<br>• carrying out a research assignment<br>• taking part in fieldwork or an excursion<br>• taking part in another educational learning activity aimed at acquiring specific skills, or<br>• participating in and completing a work placement; |
| k. | programme: | the totality and cohesion of the units of education, teaching activities/methods, contact hours, testing and examination methods and recommended literature; |
| l. | SAP/SLM: | the student information system (*Student Lifecycle Management*); |
| m. | semester: | the first (September - January) or second (February - August) half of an academic year; |
| n. | specialisation: | optional route of study within a degree programme indicating a deepening of the context of the programme (e.g. interdisciplinary or multidisciplinary); |
| o. | student | person studying; |
| p. | student statute: | sets out the rights and responsibilities of students on the one hand, and of Vrije Universiteit Amsterdam on the other hand, including those derived from the law and those derived from university regulations. The Executive Board (CvB) officially confirms the student statute once its completeness has been approved by the University Student Council (USC); |
| q. | study guide: | the guide for the study programme that provides further details of the courses, provisions and other information specific to that programme. The Study Guide is available online at https://studiegids.vu.nl/en#/; |
| r. | study monitor: (*studiemonitor*): | dashboard for students and academic advisors with data of the student and that provides insight into the student's study progress; |
| s. | subject: | see w. 'unit of education'; |
| t. | substituting course/unit of education: | see under g (double degree programme). A course obtained at the educational institute, within the context of cooperation, that is mentioned in the diploma supplement as such; not being an 'exemption'; |
| u. | thesis | a unit comprising research into the literature and/or contributing to scientific research, always resulting in a written report; |
| v. | track: | a study pathway within a broader Bachelor's or Master's degree programme, such as a fully English-language study pathway within a Dutch-language Bachelor's or Master's programme; |
| w. | unit of education: | a unit of study of the programme within the meaning of the WHW; |
| x. | university: | Vrije Universiteit Amsterdam; |
| y. | WHW: | the Dutch Higher Education and Research Act (Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek); |
| z. | workload: | the workload of the unit of education to which an examination applies, expressed in terms of credits = EC credits (ECTS = European Credit and Transfer Accumulation System). The workload for 1 year (1,680 hours) is 60 EC. |

The other terms have the meanings ascribed to them by the WHW.

# 2. Study programme structure

### Article 2.1 Structure of academic year and units of education

| | |
|---|---|
| 1. The study programme will be offered in a year divided into two semesters. | Ordinance CvB, see Appendix III |
| 2. Every semester consists of three consecutive periods. The first two periods each consist of eight weeks, and the final period consists of four weeks. | Ordinance CvB, see Appendix III |
| 3. A unit of education comprises 6 EC or a multiple thereof. | Ordinance CvB, see Appendix III |
| 4. By way of exception to paragraph 3, the Executive Board may in special cases and on request of the Faculty Board, stipulate that a unit of study comprises 3 EC or a multiple thereof. | Ordinance CvB, see Appendix III |

# 3. Assessment and examination

### Article 3.1 Signing up for education and examinations

| | |
|---|---|
| 1. Every student must sign up to participate in the units of education of the programme, the examinations and resits. The procedure for signing up is described in an annex to the student statute. | Ordinance CvB, see Appendix III |
| 2. Signing up may only take place in the designated periods. | Ordinance CvB, see Appendix III |

### Article 3.2 Type of examination

| | |
|---|---|
| 1. At the examiner's request, the Examination Board may permit a different form of examination than is stipulated in the study guide. | Advice OLC, Approval FGV (7.13 l) |

### Article 3.3 Oral examinations

| | |
|---|---|
| 1. No more than one student will be examined orally at a time, unless specified otherwise in part B for the relevant unit of education. | Advice OLC; approval FGV (7.13 l and n) |
| 2. A second examiner is present when an oral examination is being held, unless the Examination Board has determined otherwise. The oral examination takes place at a time and location to be determined by the examiner within the regular timetable, on campus or online. At the request of the student, and with the approval of the examiners, an audio recording can be made. Should the second examiner not be available unexpectedly, an audio recording of the oral exam can be made. This audio recording is retained by the university for the retention period applicable for examinations. | Advice OLC; approval FGV (7.13 l and n) |

### Article 3.4 Determining and announcing results

| | |
|---|---|
| 1. The examiner determines the result of a written examination within fifteen working days. However, the marking deadline for theses and final assignments is twenty working days after submission. The examiner will then immediately ensure that the marks are registered and also ensures that the student is immediately notified of the mark, taking due account of the applicable confidentiality standards. | Ordinance CvB, see Appendix III |
| 2. The examiner determines the result (i.e. mark) of an oral examination as soon as possible, but at the latest within one working day after the examination has finished and informs the student accordingly. The third clause of the first paragraph applies. | Advice OLC; approval FGV (7.13 o) |

| | |
|---|---|
| 3. In the case of assessments other than oral or written examinations, the Examination Board determines in advance how and by what deadline the student will be informed of the results. | Advice OLC; approval FGV (7.13 o) |

## Article 3.5 Examination opportunities

| | |
|---|---|
| 1. a. Per academic year, two opportunities to take examinations will be offered for each unit of education.<br>b. By way of exception to a., the options for retaking practical exercises, work placements and theses are detailed in the relevant work placement manual, course manual of teaching regulations. | Ordinance CvB, see Appendix III |
| 2. The most recent mark will apply in the event of a resit. A resit is allowed for both passed and failed units of study. | Ordinance CvB, see Appendix III |
| 3. The resit for an (partial) examination may not take place within ten working days of the announcement of the results for the original (partial) examination. Exceptions are only possible in period 6. | Advice OLC; approval FGV (7.13 j) |
| 4. The Examination Board may allow a student an extra opportunity to sit an examination if that student:<br>a) lacks only those credits to qualify for their degree; and<br>b) has failed the examination during all the previously offered attempts unless participation in an examination was not possible for compelling reasons.<br>The extra opportunity can only be offered if it concerns a written examination, a paper or a take home examination. This provision excludes the practical exercises and the Master's thesis. Requests for an additional examination opportunity must be submitted to the Examination Board no later than 15 July. If necessary, the method of examination may deviate from the provisions in the study guide. | Ordinance CvB, see Appendix III |
| 5. If a unit of education is no longer offered in the following academic year, at least one additional opportunity will subsequently be provided to sit the examination(s) or parts thereof and a transitional arrangement will be included in section B. | Advice OLC, approval FGV (7.13 j) |

## Article 3.6 Marks

| | |
|---|---|
| 1. (Partial) grades are given on a scale from 1 to 10 with no more than one figure after the decimal point. | Ordinance CvB, see Appendix III |
| 2. A final mark between 5 and 6 will be rounded to the nearest whole number: final marks below 5.50 will be rounded down; final marks of 5.50 or higher will be rounded up. All other final marks will be expressed in whole or half marks.<br><br>In case 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: | Ordinance CvB, see Appendix III |

| From | To | Grade |
|---|---|---|
| 1.00 | 1.24 | 1.0 |
| 1.25 | 1.74 | 1.5 |
| 1.75 | 2.24 | 2.0 |
| 2.25 | 2.74 | 2.5 |
| 2.75 | 3.24 | 3.0 |
| 3.25 | 3.74 | 3.5 |
| 3.75 | 4.24 | 4.0 |
| 4.25 | 4.74 | 4.5 |
| 4.75 | 5.49 | 5.0 |
| 5.50 | 6.24 | 6.0 |

| | | |
|---|---|---|
| 6.25 | 6.74 | 6.5 |
| 6.75 | 7.24 | 7.0 |
| 7.25 | 7.74 | 7.5 |
| 7.75 | 8.24 | 8.0 |
| 8.25 | 8.74 | 8.5 |
| 8.75 | 9.24 | 9.0 |
| 9.25 | 9.74 | 9.5 |
| 9.75 | 10.0 | 10 |

| | |
|---|---|
| 3. To pass a given course or unit, a final mark of 6 or higher is required. | Ordinance CvB, see Appendix III |
| 4. The Examination Board can allow the use of symbols rather than numbers, for example: s(atisfactory), g(ood), u(n)s(at)is(factory), etc. In case a student does not take part in any examination, the examiner will register the mark 'ns' (c.q. no show). | Ordinance CvB, see Appendix III |

## Article 3.7 Exemption

| | |
|---|---|
| 1. At the written request of the student, the Examination Board may exempt the student from taking one or more examination components, if they:<br>a) have either passed a unit of education at a university of applied science (hbo) or research university (wo) that is equivalent in terms of content and level;<br>b) or have demonstrated through their work and/or professional experience that they have sufficient knowledge and skills with regard to the relevant unit of education. | Advice OLC; approval FGV (7.13 r) |
| 2. The Master's thesis is excluded from this exemption possibility. | Advice OLC; approval FGV (9.38 sub b) |
| 3. a. A maximum of 18 EC for a one-year master's programme and 36 EC for a two-year master's programme can be accumulated through granted exemptions. The substituting courses (courses obtained at another educational institute within the context of a double degree, see art. 1.2) are not included.<br>b. This regulation does not apply if a student is (simultaneously) enrolled in multiple programmes, which lead to multiple degrees, where courses may be part of both programmes. In such a case, the examination board may deviate from the regulations under a. | Advice OLC; approval FGV (9.38 sub b) |

## Article 3.8 Validity period for results

| | |
|---|---|
| 1. The validity period of examinations passed and exemption from examinations is unlimited, unless otherwise specified in Section B. | Legal provision |
| 2. The validity period of a partial examination is limited to the academic year in which it was sat or until the end of the unit of study concerned, as stipulated for the relevant unit of study in Section B. In exceptional circumstances, an examiner may deviate from this; this must be stated on Canvas at the start of the unit of education. | Advice OLC; approval FGV (9.38 sub b) |

## Article 3.9 Right of inspection and post-examination discussion

| | |
|---|---|
| 1. Within twenty working days after the announcement of the results of a written examination, but at least ten working days before the resit opportunity for that examination, the student can submit a request to review their graded examination. | Advice OLC; approval FGV (7.13 p and q) |

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|---|---|
| 2. Students can view the questions and assignments set in the written examination, and the standards applied when assessing the examination, within the period specified in 3.9.1. | Advice OLC; approval FGV (7.13 q) |
| 3. The examiner determines whether the inspection takes place collectively or individually. In all cases, the time and place of the inspection is announced in the course manual or learning environment. | Advice OLC; approval FGV (7.13 q) |
| 4. Students are entitled to feedback on their academic performance. The manner in which this is provided in each unit of education is described in the course manual. Feedback is provided at a time and location to be determined by the examiner within the regular timetable, on campus or online. | Advice OLC; approval FGV (7.13 p and q) |

# 4. Academic student counselling and study progress

## Article 4.1 Administration of study progress and academic student counselling

| | |
|---|---|
| 1. The faculty board is responsible for the correct registration of the students' study results. After the assessment of a unit of education has been registered, every student has the right to inspect the result for that component and also has a list of the results achieved at their disposal in VU.nl Dashboard. | Advice OLC; approval FGV (7.13 u) |
| 2. Enrolled students are eligible for academic student counselling.<br>Academic student counselling is in any case provided by<br>a. The Student Counsellor<br>b. Student psychologists<br>c. Faculty academic advisers | Advice OLC; approval FGV (7.13 u) |

## Article 4.2 Facilities for students with a disability or impairment

| | |
|---|---|
| 1. A student with a disability or impairment can submit a request via VU.nl Dashboard to qualify for one or more special facilities with regard to teaching, practical exercises and examinations. These facilities will accommodate the student's individual disability or impairment as much as possible, but may not alter the quality or degree of difficulty of a unit of education or an examination. In all cases, the student must fulfil the exit qualifications for the study programme. | Advice OLC; approval FGV (7.13 m) |
| 2. The request referred to in the first paragraph must be accompanied by a statement from a doctor or psychologist. If possible, an estimate should be given of the potential impact on the student's study progress. In case of a chronic disability a single (one time) request suffices. | Advice OLC; approval FGV (7.13 m) |
| 3. Students who have been diagnosed with dyslexia must provide a statement from a BIG-, NIP- or NVO-registered professional who is qualified to conduct a psychological evaluation. | Advice OLC; approval FGV (7.13 m) |
| 4. The faculty board, or the person acting on behalf of the faculty board, decides on teaching facilities and facilities regarding logistics. The Examination Board will decide on requests for facilities with regard to examinations. | Advice OLC; approval FGV (7.13 m) |
| 5. In the event of a positive decision in response to a request as referred to in paragraph 1, the student can make an appointment with the academic adviser to discuss the details of the provisions. | Advice OLC; approval FGV (7.13 m) |
| 6. A request for one or more facilities can be refused if it would place a disproportionate burden on the organization or the resources of the faculty or university were it upheld. Any such refusal will be substantiated. | Advice OLC; approval FGV (7.13 m) |
| 7. If the disability or impairment justifies an extension of the examination time, the | Advice OLC; |

| | |
|---|---|
| responsible person on behalf of the Examination Board will register in SAP this entitlement to an extension. If a disability or impairment justifies other measures to be taken, the academic adviser can take the necessary measures. The student can consult the study monitor to check which facilities have been granted to them. | approval FGV (7.13 m) |
| 8. The decision as referred to in paragraph 5 may specify a limited validity of the facilities granted. | Advice OLC; approval FGV (7.13 m) |

# 5. Hardship clause

## Article 5.1 Hardship clause

| | |
|---|---|
| 1. In instances not regulated by the Teaching and Examination Regulations or in the event of demonstrable extreme unreasonableness or unfairness, the faculty board responsible for the study programme will decide, unless the matter concerned is the responsibility of the Examination Board. | Advice OLC; approval FGV (9.38 sub b) |

# Section B1: Programme specific – general provisions

## 6. General programme information and characteristics

### Article 6.1 Study programme information

| | |
|---|---|
| 1. The programme Computer Science (joint degree) CROHO number 65014 is offered on a full-time basis. | Advice OLC; approval FGV (7.13 i) |
| 2. The programme is offered in partnership with the University of Amsterdam (UvA) and leads to a joint degree. | Advice OLC; approval FGV (9.38 sub b) |

### Article 6.2 Teaching formats used and modes of assessment

| | |
|---|---|
| 1. The programme uses the teaching formats as specified in the study guide. | Advice OLC; approval FGV (7.13 x) |
| 2. The modes of assessment used per unit of education are specified in the study guide. | Advice OLC; approval FGV (7.13 l) |

### Article 6.3 Academic student counselling

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|---|---|
| 1. The programme offers the following counselling in addition to the student counselling mentioned in Section A:<br>- There is an academic advisor for the Master Computer Science. | Advice OLC; approval FGV (7.13 u) |

## 7. Further admission requirements

### Article 7.1 Intake date(s)

| | |
|---|---|
| 1. The programme starts on 1 September. | Advice OLC; approval FGV (9.38 sub b) |

### Article 7.2 Admission requirements

| | |
|---|---|
| 1. Admission to the Master's programme is possible for an applicant who has obtained a Bachelor's degree obtained at an institution of academic higher education, which demonstrates the following knowledge, understanding and skills:<br>a. knowledge: at least 120 EC of Computer Science subjects, out of which at least 90 EC covering the following key subjects:<br>a. **Mathematics** (Linear Algebra, Discrete Mathematics, Statistics)<br>b. **Foundations of Computer Science** (Algorithms, Logic, Automata, Graph Theory)<br>c. **Software Development** (Programming, Software Testing, Concepts of Programming Languages, Software Engineering Methods, Software Development Projects)<br>d. **Computer Systems** (Operating Systems, Computer Networks, Computer Organisation, Compilers)<br>e. **Data and Information Systems** (Databases, Web Technology, Machine Learning, Artificial Intelligence) | Advice OLC, approval FGV (9.38 sub b) |

| | |
|---|---|
| b. understanding: the role of Computer Science in society and related ethical issues; empirical aspects of Computer Science, especially the evaluation of various types of systems, both in qualitative and quantitative terms<br>c. skills: ability to communicate professionally and at an academic level, both orally and in writing; an analytical and problem-solving attitude; ability to reflect on his or her own activities and thought processes.<br><br>Any applicant with a Bachelor's degree in Computer Science from a Dutch University meets the requirements referred to in this article. | |
| 2. Not applicable (no additional requirements for tracks). | Advice OLC, approval FGV (9.38 sub b) |
| 3. Applicants with a Bachelor's degree obtained at an institution outside the Netherlands may be asked for additional methods to prove that they meet the admission requirements. | Advice OLC; approval FGV (9.38 sub b) |
| ~~4.~~ Not applicable (not a Dutch language programme). | Advice OLC; approval FGV (9.38 sub b) |
| 5. Applicants should demonstrate that they have a sufficient level of proficiency in English by meeting at least one of the following standards:<br>- (academic) IELTS: a minimum overall score of 6.5 plus a minimum score of 6.0 for each subcomponent (Listening, Reading, Writing and Speaking);<br>- TOEFL internet-based test (iBT): a minimum overall score of 92 plus a minimum score of 12 for the Listening section, 13 for the Reading section, 21 for the Writing section, and 18 for the Speaking section.<br>- Cambridge Certificate of Proficiency in English (CPE) or Cambridge Certificate of Advanced English (CAE): overall score of at least 180;<br>- Secondary education state exam: VWO English language and literature;<br>IELTS and TOEFL tests have a validity of 2 years, whilst Cambridge tests are valid indefinitely. | Advice OLC; approval FGV (9.38 sub b) |
| 6. Applicants who have completed one of the following meet the English language requirement and therefore are exempted from taking an English language test (as mentioned in the previous section) if:<br>- a secondary education or higher education degree fully taught in English has been completed in Australia, Canada (except Quebec province), Ireland, New Zealand, Singapore, South Africa, the United Kingdom or the United States of America;<br>- a bachelor's or master's degree fully taught in English has been completed in a member state of the European Union/European Economic Area;<br>- a bachelor's or master's degree completed in a research university (*WO*, meaning *wetenschappelijk onderwijs*) in the Netherlands;<br>- have earned a Dutch VWO diploma or equivalent diploma in which English of a level comparable to VWO is required. | Advice OLC; approval FGV (9.38 sub b) |
| 7. The Admission Board will investigate whether the applicant meets the admission requirements. | Advice OLC; approval FGV (9.38 sub b) |

## Article 7.3 Selection criteria

Not applicable.

### Article 7.4 Pre-Master's programme

| | |
|---|---|
| 1. Applicants with a Bachelor's degree from a university of applied sciences (HBO) or a Bachelor's degree from a research university (WO) who wish to enter the programme but do not fulfill the admission requirements as stipulated in Article 7.2 can request admission to the pre-Master's programme. (The pre-Master's programme is only available to applicants with a Bachelor's degree issued within the EEA.)<br>Article 2 of these regulations does not apply to admission to a bridging or pre-Master's programme. The provisions of sections A and B only apply to the extent that they are described in Article 7.4. Information about the programme from part B2 applies, insofar as it concerns the units of education from the pre-Master's programme. | Advice OLC; approval FGV (9.38 sub b) |
| 1. Applicants must, in addition to paragraph 1 above, also satisfy the following requirements regarding:<br>Knowledge: Have obtained a Bachelor's degree from the field of Science, Technology, Engineering, and Mathematics (STEM).<br>Insight: Ability to reason about software systems and computers in general.<br>Skills: A high-level of academic skills, demonstrated by an average mark for the Bachelor's degree programme of at least 7.5 on the scale used in the Netherlands, or equivalent. | Advice OLC; approval FGV (9.38 sub b) |
| 2. A candidate must demonstrate that they meet the language requirements, as specified in Article 7.2. | |
| 3. The pre-Master's programme has 30 credits and is determined for each student individually.<br>The following terms also apply:<br>a. If the pre-Master's student is completing an individualized pre-Master's programme, this is to be communicated to the student in writing.<br>b. The Examination Board can, if the pre-Master's student submits a written request, exempt the enrolee from one or more examinations.<br>c. Article 3.5.4 does not apply to pre-Master's students. | Advice OLC; approval FGV (9.38) |
| 4. Evidence that the pre-Master's programme has been completed successfully will entitle the student to admission to the relevant Master's programme in the following academic year. A pre-Master's programme must be completed within one academic year. | Advice OLC; approval FGV (9.39) |

# 8. Examinations and results

### Article 8.1 Sequence of examinations

| | |
|---|---|
| 1. Students may participate in the units of education listed below only if they have passed the examination or examinations for following units of education:<br>- XM_0011 Master Project Computer Science after accumulating a minimum of 84 EC from MSc Computer Science courses. | Advice OLC; approval FGV (7.13 h, s & t) |

## Article 8.2 Validity period for results

| | |
|---|---|
| 1. The validity period of the examinations and exemptions from examinations below, is limited as follows:<br>a. See Article 3.8 of the Teaching and Examination Regulations, section A. No further specific provisions. | Advice OLC; approval FGV (7.13 k) |
| 2. A student may request the Examination Board to extend the validity of an exam. If the student's knowledge is demonstrably outdated, or if the student's skills and insights are demonstrably outdated, the Examination Board may impose a supplementary examination, impose a replacement examination or refuse to extend the period of validity. | Legal provision |
| 3. In situations where a limited period of validity applies, the period of validity of examinations may be extended in the event of extenuating circumstances as stipulated in WHW Article 7.51, paragraph 2, with at least the period of allocated financial assistance specified in WHW Article 7.15, paragraph 1. | Legal provision |

# Section B2: Programme specific – content of programme

## 9. Programme objectives, tracks/specialisations, exit qualifications and language

### Article 9.1 Workload

| | |
|---|---|
| 1. The programme has a workload of 120 EC. | Advice OLC; (7.13 a) |

### Article 9.2 Tracks and/or specialisations

| | |
|---|---|
| 1. The programme has the following tracks and/or specialisations:<br>- BDE: Big Data Engineering;<br>- CSI: Computer Systems and Infrastructure;<br>- FCC: Foundations of Computing and Concurrency;<br>- SEG: Software Engineering and Green IT;<br>- International track SE4GD: Software Engineers for Green Deal<br>- *CSS: Computer Systems Security*[1]*;*<br>- *IWT: Internet and Web Technology*[2]*;*<br>- *PCS: Parallel Computing Systems*[3]*;*<br>- *SLA: Systems for Large-Scale Applications*[4]*.* | Approval OLC; (7.13 a) |

### Article 9.3 Programme objective

| | |
|---|---|
| 1. The programme aims to:<br>- provide students with the knowledge, experience and insights which are needed to autonomously carry out professional duties as a computer scientist;<br>- offer students a solid basis for a career in the industry at an academic level;<br>- prepare students for further education to become a scientific researcher;<br>- provide students with an understanding of the position of Computer Science in a broader societal and scientific context;<br>- educate students in the broad domain of Computer Science, while allowing them to specialize in a direction related to big data, theoretical foundations, computer systems and infrastructure, systems for large-scale applications, or software engineering;<br>- extend and enhance the students' knowledge and, by concentrating on specific areas within the Computer Science domain, lead the student towards the | Advice OLC; (7.13 a) |

[1] The CSS track (Computer Systems Security) has been discontinued on September 1, 2022. Students who started in the academic year 2021-2022 or earlier are still allowed to complete it until January 31, 2025. No diplomas will be issued starting from February 1, 2025.
[2] The IWT track (Internet and Web Technology) has been discontinued on September 1, 2023. Students who started in the academic year 2022-2023 or earlier are still allowed to complete it until January 31, 2026. No diplomas will be issued starting from February 1, 2026.
[3] The PCS track (Parallel Computing Systems) has been discontinued on September 1, 2023. Students who started in the academic year 2022-2023 or earlier are still allowed to complete it until January 31, 2026. No diplomas will be issued starting from February 1, 2026.
[4] The SLA track (Systems for Large-Scale Applications) has been discontinued on September 1, 2024. Students who started in the academic year 2023-2024 are still allowed to complete it until August 31, 2026. No diplomas will be issued starting from September 1, 2026.

| | |
|---|---|
| frontiers of design and application, as well as major research issues in the chosen specialization. | |

## Article 9.4 Exit qualifications

| | |
|---|---|
| 1. At all events, a graduate of the study programme will have:<br>- knowledge and understanding in the field of Computer Science.<br><br>A graduate of the Master's programme in Computer Science:<br>1) possesses solid academic knowledge and insight in the field of computer science, including the required background knowledge from other academic disciplines, which builds upon and goes beyond the level of a Bachelor's degree;<br>2) has knowledge, insight and skills of a specialist nature in at least one area of computer science (additional final attainment levels to be given for each specialization separately);<br>3) is able to acquire specialist knowledge, insights and skills in other areas of computer science within a reasonable period of time, and to keep his or her abilities up to date throughout his or her whole professional career;<br>4) has acquired practical skills at Master level within the field of computer science;<br>5) is aware of the applications of computer science in general and of the chosen specialization in particular, and is able to apply their knowledge and skills to new or otherwise unknown problems;<br>6) is capable of designing a research or project plan on the basis of a realistic problem description in the field of computer science and can contribute to its progress with original solutions;<br>7) is able to carry out research independently, both individually and in small teams.<br>8) is able to consult and use the international professional literature in the field of computer science;<br>9) is able to formulate, analyse and evaluate scientific results, and to use them to draw conclusions;<br>10) is able to function in professional situations in an international context where scientific knowledge and skills in computer science are required;<br>11) has developed a critical, scientific attitude and a societal perspective on information technology;<br>12) is able to communicate with others at a professional level and can give clear oral and written presentations of the results of his/her work;<br>13) is thoroughly prepared for further education at doctorate level or for further postgraduate education as a professional computer scientist. | Approval OLC (7.13 ) |
| 2. Notwithstanding the provisions of paragraph 1:<br><br>a. a graduate of the track/specialization **Big Data Engineering** will have the following knowledge and understanding in the field of:<br>1) BDE-1. Developing efficient pipelines for data preparation and data mining;<br>2) BDE-2. Acquiring experience with algorithms and infrastructure for managing big data;<br>3) BDE-3. Designing solutions for advanced data analytics using big data platforms. | Approval OLC (7.13 b) |

| | |
|---|---|
| b. a graduate of the track/specialization **Computer Systems and Infrastructure** will have the following knowledge and understanding in the field of:<br>1) CSI-1. Designing modern computing and networking infrastructures for supporting resource-demanding, data-intensive applications;<br>2) CSI-2. Programming low-level systems-oriented software for emerging computing and networking hardware in the context of both cloud data centers and edge devices, with energy and security in mind;<br>3) CSI-3. Conducting experiments on modern computer systems and networks and being able to properly interpret data resulting from such experiments.<br><br>c. a graduate of the track/specialization **Foundations of Computing and Concurrency** will have the following knowledge and understanding in the field of:<br>1) FCC-1. Models of computation;<br>2) FCC-2. Models of concurrency;<br>3) FCC-3. Automated verification;<br><br>d. a graduate of the track/specialization **Software Engineering and Green IT** will have the following knowledge and understanding in the field of:<br>1) SEG-1. Design and development of complex software systems by applying current software engineering theories, models, and techniques;<br>2) SEG-2. Reconciling the possibly-conflicting objectives of a complex software system and finding acceptable compromises in terms of its cost, time, resources, organisational constraints, and societal impact;<br>3) SEG-3. Execution of scientific experiments (and empirical studies in general) for objectively assessing the energy efficiency and sustainability of complex software systems.<br><br>e. a graduate of the **International track SE4GD: Software Engineers for Green Deal** will have the following knowledge and understanding in the field of:<br>1) Having a sustainability mindset built upon software engineering competencies;<br>2) Ability to innovate, design, and implement software solutions for different sustainability challenge;<br>3) Integration into a multi-cultural working environment with practical orientation and collaborating in professional networks<br><br>f. a graduate of the track/specialization **Systems for Large-Scale Applications** will have the following knowledge and understanding in the field of:<br>1) SLA-1. Designing distributed computer (eco)systems, for information processing, compute intensive, and intelligent and interactive applications on the Internet with operational requirements;<br>2) SLA-2. Meeting operational requirements for, and improving the performance, dependability, and efficiency of application programs, and the related runtime systems, resource management and scheduling, and middleware services;<br>3) SLA-3. Conducting experiments and empirical research on networked applications, and on parallel and distributed (eco)systems, and properly interpreting experimental and empirical results. | |

| | |
|---|---|
| g. a graduate of the track/specialization **Computer Systems Security** will have the following knowledge and understanding in the field of:<br>1) CSS-1. Security issues in system-level software including weaknesses and defenses;<br>2) CSS-2. Static and dynamic analysis techniques for software (benign and malicious);<br>3) CSS-3. Security implications of modern hardware features (side channels, hardware bugs, and hardware-based protection).<br><br>h. graduate of the track/specialization **Internet and Web Technology** will have the following knowledge and understanding in the field of<br>1) IWT-1. Distributed computer systems, notably in the form of capabilities for designing networked systems and with emphasis on efficient information processing on the Internet;<br>2) IWT-2. Programming large and complex pieces of (possibly low-level) systems-oriented software.<br>3) IWT-3. Conducting experiments on networked applications and distributed systems, and be able to properly interpret data that result from such experiments.<br><br>i. a graduate of the track/specialization **Parallel Computing Systems** will have the following knowledge and understanding in the field of<br>1) PCS-1. Design and architecture of parallel and distributed computing systems;<br>2) PCS-2. Performance and efficiency of application programs and the related runtime systems and middleware services;<br>3) PCS-3. Conducting experiments as a means for the analysis of high-performance systems, and be able to properly interpret data that result from such experiments. | |
| 3. Language proficiency may be taken into account in the assessment of examinations. | Approval OLC (7.13 c) |

### Article 9.5 Language of instruction

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|---|---|
| 1. The language of instruction is English. | Approval OLC (9.18) |
| 2. The 'Gedragscode vreemde taal' (Code of conduct foreign languages) applies. | Ordinance CvB, see Appendix III |

## 10. Curriculum structure

### Article 10.1 Composition of the programme

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|---|---|
| 1. The programme comprises at least a package of compulsory components and an individual Master's thesis or academic internship. | Ordinance CvB, see Appendix III |
| 2. Additionally the programme can offer:<br>- Practical electives<br>- Electives. | Advice OLC; (7.13 a) |

| | |
|---|---|
| 3. Units of education are categorized as specialized (400), research oriented (500) and highly specialized (600) level. | Ordinance CvB, see Appendix III |

## Article 10.2 Compulsory units of education

*A detailed description per unit of education can be found in the Study Guide.*

| **Track Big Data Engineering** | | | | |
|---|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | Advice OLC; (7.13 a) |
| Master Project Computer Science | XM_0011 | 30 | 600 | |
| M CS Track BDE Constrained Choice | | | | |
| Mathematics *Select at least 6 EC* | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| Societal Perspectives on Computer Science *Select at least 6 EC* | | | | |
| History of Digital Cultures | XM_0134 | 6 | 400 | |
| Entrepreneurship in Analyt and AI | XM_0090 | 6 | 400 | |
| ICT for the Global North | XM_0143 | 6 | 400 | |
| ICT for the Global South | XM_0142 | 6 | 400 | |
| E-Commerce Law | R_E.commerc | 6 | 500 | |
| Security *Select at least 6 EC* | | | | |
| Software Security | X_400127 | 6 | 400 | |
| Network Security | XM_0100 | 6 | 400 | |
| Security Experiments and Measurements | XM_0098 | 6 | 400 | |
| Security and Machine Learning | XM_0135 | 6 | 500 | |
| Verification for Security | XM_0099 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| Cryptographic Engineering | XMU_0047 | 6 | 400 | |
| Secure Computation | XMU_0065 | 6 | 400 | |
| Research Skills *Select at least 6 EC* | | | | |
| Research Project Computer Science | XM_0129 | 6 | 500 | |
| Large Research Project Computer Science | XM_0130 | 12 | 500 | |
| Literature Study | XM_0131 | 6 | 500 | |
| Systems Seminar | XM_0122 | 6 | 600 | |
| Software Engineering & Green IT Core *Select at least 6 EC* | | | | |
| Digitalization and Sustainability | XM_0089 | 6 | 500 | |
| Software Asset Management | X_400412 | 6 | 400 | |
| Service Oriented Design | X_405061 | 6 | 400 | |
| Green Lab | X_418158 | 6 | 500 | |
| Digital Architecture | XM_0127 | 6 | 400 | |

| | | | | |
|---|---|---|---|---|
| Fundamentals of Adaptive Software | XM_0128 | 6 | 400 | |
| Software Language Engineering | XM_0172 | 6 | 400 | |
| Software Testing | X_400439 | 6 | 400 | |
| Projects System Testing | X_405124 | 6 | 400 | |
| Foundations of Computing and Concurrency Core<br>*Select at least 6 EC* | | | | |
| Algorithmic Game Theory | XMU_0063 | 6 | 400 | |
| Information Theoretic Learning | XMU_0064 | 6 | 400 | |
| Advanced Algorithms | XMU_0060 | 6 | 400 | |
| Logical Verification | XM_0167 | 6 | 400 | |
| Functional Programming | XMU_0062 | 6 | 400 | |
| Term Rewriting Systems | XM_400121 | 6 | 500 | |
| Advanced Logic | X_405048 | 6 | 500 | |
| Computational Complexity | XMU_0061 | 6 | 400 | |
| Geometric Algorithms | XM_0168 | 6 | 400 | |
| Distributed Algorithms | X_400211 | 6 | 500 | |
| Big Data Engineering Core<br>*Students enrolled in the BDE track must select at least four courses out of this list* | | | | |
| Data Preparation | XMU_0058 | 6 | 400 | |
| Web Data Processing Systems | XM_40020 | 6 | 400 | |
| Data Protection Technologies | XMU_0057 | 6 | 400 | |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 | |
| Data Mining Techniques | X_400108 | 6 | 400 | |
| Computer Systems and Infrastructure Core<br>*Select at least 6 EC* | | | | |
| Individual Systems Practical | XM_405088 | 6 | 500 | |
| Advanced Operating Systems | XM_40014 | 6 | 500 | |
| Programming Large-scale Parallel Systems | XM_400017 | 6 | 400 | |
| Distributed Systems | X_400130 | 6 | 400 | |
| Parallel Programming Practical | X_400162 | 6 | 400 | |
| Multi-core Processor Systems | XMU_0055 | 6 | 400 | |
| Energy-efficient Edge Computing | XMU_0056 | 6 | 400 | |
| Accelerator-Centric Computing Eco | XM_0171 | 6 | 400 | |

| **Track Computer Systems and Infrastructure** | | | | |
|---|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | Advice OLC; (7.13 a) |
| Master Project Computer Science | XM_0011 | 30 | 600 | |
| M CS Track BDE Constrained Choice | | | | |
| Mathematics<br>*Select at least 6 EC* | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |

| Societal Perspectives on Computer Science<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| History of Digital Cultures | XM_0134 | 6 | 400 |
| Entrepreneurship in Analyt and AI | XM_0090 | 6 | 400 |
| ICT for the Global North | XM_0143 | 6 | 400 |
| ICT for the Global South | XM_0142 | 6 | 400 |
| E-Commerce Law | R_E.commerc | 6 | 500 |

| Security<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Software Security | X_400127 | 6 | 400 |
| Network Security | XM_0100 | 6 | 400 |
| Security Experiments and Measurements | XM_0098 | 6 | 400 |
| Security and Machine Learning | XM_0135 | 6 | 500 |
| Verification for Security | XM_0099 | 6 | 400 |
| Software Threat Analysis | XM_0124 | 6 | 400 |
| Cryptographic Engineering | XMU_0047 | 6 | 400 |
| Secure Computation | XMU_0065 | 6 | 400 |

| Research Skills<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Research Project Computer Science | XM_0129 | 6 | 500 |
| Large Research Project Computer Science | XM_0130 | 12 | 500 |
| Literature Study | XM_0131 | 6 | 500 |
| Systems Seminar | XM_0122 | 6 | 600 |

| Software Engineering & Green IT Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Digitalization and Sustainability | XM_0089 | 6 | 500 |
| Software Asset Management | X_400412 | 6 | 400 |
| Service Oriented Design | X_405061 | 6 | 400 |
| Green Lab | X_418158 | 6 | 500 |
| Digital Architecture | XM_0127 | 6 | 400 |
| Fundamentals of Adaptive Software | XM_0128 | 6 | 400 |
| Software Language Engineering | XM_0172 | 6 | 400 |
| Software Testing | X_400439 | 6 | 400 |
| Projects System Testing | X_405124 | 6 | 400 |

| Foundations of Computing and Concurrency Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Algorithmic Game Theory | XMU_0063 | 6 | 400 |
| Information Theoretic Learning | XMU_0064 | 6 | 400 |
| Advanced Algorithms | XMU_0060 | 6 | 400 |
| Logical Verification | XM_0167 | 6 | 400 |
| Functional Programming | XMU_0062 | 6 | 400 |
| Term Rewriting Systems | XM_400121 | 6 | 500 |
| Advanced Logic | X_405048 | 6 | 500 |
| Computational Complexity | XMU_0061 | 6 | 400 |
| Geometric Algorithms | XM_0168 | 6 | 400 |
| Distributed Algorithms | X_400211 | 6 | 500 |

| | | | |
|---|---|---|---|
| Big Data Engineering Core<br>*Select at least 6 EC* | | | |
| Data Preparation | XMU_0058 | 6 | 400 |
| Web Data Processing Systems | XM_40020 | 6 | 400 |
| Data Protection Technologies | XMU_0057 | 6 | 400 |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 |
| Data Mining Techniques | X_400108 | 6 | 400 |
| | | | |
| Computer Systems and Infrastructure Core<br>*Students enrolled in the CSI track must select at least four courses out of this list* | | | |
| Individual Systems Practical | XM_405088 | 6 | 500 |
| Advanced Operating Systems | XM_40014 | 6 | 500 |
| Programming Large-scale Parallel Systems | XM_400017 | 6 | 400 |
| Distributed Systems | X_400130 | 6 | 400 |
| Parallel Programming Practical | X_400162 | 6 | 400 |
| Multi-core Processor Systems | XMU_0055 | 6 | 400 |
| Energy-efficient Edge Computing | XMU_0056 | 6 | 400 |
| Accelerator-Centric Computing Eco | XM_0171 | 6 | 400 |

| **Track Computer Science track Foundations of Computing and Concurrency** | | | | |
|---|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | Advice OLC; (7.13 a) |
| Master Project Computer Science | XM_0011 | 30 | 600 | |
| | | | | |
| M CS Track BDE Constrained Choice | | | | |
| Mathematics<br>*Select at least 6 EC* | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| | | | | |
| Societal Perspectives on Computer Science<br>*Select at least 6 EC* | | | | |
| History of Digital Cultures | XM_0134 | 6 | 400 | |
| Entrepreneurship in Analyt and AI | XM_0090 | 6 | 400 | |
| ICT for the Global North | XM_0143 | 6 | 400 | |
| ICT for the Global South | XM_0142 | 6 | 400 | |
| E-Commerce Law | R_E.commerc | 6 | 500 | |
| | | | | |
| Security<br>*Select at least 6 EC* | | | | |
| Software Security | X_400127 | 6 | 400 | |
| Network Security | XM_0100 | 6 | 400 | |
| Security Experiments and Measurements | XM_0098 | 6 | 400 | |
| Security and Machine Learning | XM_0135 | 6 | 500 | |
| Verification for Security | XM_0099 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| Cryptographic Engineering | XMU_0047 | 6 | 400 | |

| | | | |
|---|---|---|---|
| Secure Computation | XMU_0065 | 6 | 400 |

| Research Skills<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Research Project Computer Science | XM_0129 | 6 | 500 |
| Large Research Project Computer Science | XM_0130 | 12 | 500 |
| Literature Study | XM_0131 | 6 | 500 |
| Systems Seminar | XM_0122 | 6 | 600 |

| Software Engineering & Green IT Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Digitalization and Sustainability | XM_0089 | 6 | 500 |
| Software Asset Management | X_400412 | 6 | 400 |
| Service Oriented Design | X_405061 | 6 | 400 |
| Green Lab | X_418158 | 6 | 500 |
| Digital Architecture | XM_0127 | 6 | 400 |
| Fundamentals of Adaptive Software | XM_0128 | 6 | 400 |
| Software Language Engineering | XM_0172 | 6 | 400 |
| Software Testing | X_400439 | 6 | 400 |
| Projects System Testing | X_405124 | 6 | 400 |

| Foundations of Computing and Concurrency Core<br>*Students enrolled in the FCC track must select at least four courses out of this list* | | | |
|---|---|---|---|
| Algorithmic Game Theory | XMU_0063 | 6 | 400 |
| Information Theoretic Learning | XMU_0064 | 6 | 400 |
| Advanced Algorithms | XMU_0060 | 6 | 400 |
| Logical Verification | XM_0167 | 6 | 400 |
| Functional Programming | XMU_0062 | 6 | 400 |
| Term Rewriting Systems | XM_400121 | 6 | 500 |
| Advanced Logic | X_405048 | 6 | 500 |
| Computational Complexity | XMU_0061 | 6 | 400 |
| Geometric Algorithms | XM_0168 | 6 | 400 |
| Distributed Algorithms | X_400211 | 6 | 500 |

| Big Data Engineering Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Data Preparation | XMU_0058 | 6 | 400 |
| Web Data Processing Systems | XM_40020 | 6 | 400 |
| Data Protection Technologies | XMU_0057 | 6 | 400 |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 |
| Data Mining Techniques | X_400108 | 6 | 400 |

| Computer Systems and Infrastructure Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Individual Systems Practical | XM_405088 | 6 | 500 |
| Advanced Operating Systems | XM_40014 | 6 | 500 |
| Programming Large-scale Parallel Systems | XM_400017 | 6 | 400 |
| Distributed Systems | X_400130 | 6 | 400 |
| Parallel Programming Practical | X_400162 | 6 | 400 |
| Multi-core Processor Systems | XMU_0055 | 6 | 400 |

| | | | | |
|---|---|---|---|---|
| Energy-efficient Edge Computing | XMU_0056 | 6 | 400 | |
| Accelerator-Centric Computing Eco | XM_0171 | 6 | 400 | |
| | | | | |
| **Track Software Engineering & Green IT** | | | | |
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | Advice OLC; (7.13 a) |
| Master Project Computer Science | XM_0011 | 30 | 600 | |
| | | | | |
| M CS Track BDE Constrained Choice | | | | |
| Mathematics<br>*Select at least 6 EC* | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| | | | | |
| Societal Perspectives on Computer Science<br>*Select at least 6 EC* | | | | |
| History of Digital Cultures | XM_0134 | 6 | 400 | |
| Entrepreneurship in Analyt and AI | XM_0090 | 6 | 400 | |
| ICT for the Global North | XM_0143 | 6 | 400 | |
| ICT for the Global South | XM_0142 | 6 | 400 | |
| E-Commerce Law | R_E.commerc | 6 | 500 | |
| | | | | |
| Security<br>*Select at least 6 EC* | | | | |
| Software Security | X_400127 | 6 | 400 | |
| Network Security | XM_0100 | 6 | 400 | |
| Security Experiments and Measurements | XM_0098 | 6 | 400 | |
| Security and Machine Learning | XM_0135 | 6 | 500 | |
| Verification for Security | XM_0099 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| Cryptographic Engineering | XMU_0047 | 6 | 400 | |
| Secure Computation | XMU_0065 | 6 | 400 | |
| | | | | |
| Research Skills<br>*Select at least 6 EC* | | | | |
| Research Project Computer Science | XM_0129 | 6 | 500 | |
| Large Research Project Computer Science | XM_0130 | 12 | 500 | |
| Literature Study | XM_0131 | 6 | 500 | |
| Systems Seminar | XM_0122 | 6 | 600 | |
| | | | | |
| Software Engineering & Green IT Core<br>*Students enrolled in the SEG track must select at least four courses out of this list* | | | | |
| Digitalization and Sustainability | XM_0089 | 6 | 500 | |
| Software Asset Management | X_400412 | 6 | 400 | |
| Service Oriented Design | X_405061 | 6 | 400 | |
| Green Lab | X_418158 | 6 | 500 | |
| Digital Architecture | XM_0127 | 6 | 400 | |
| Fundamentals of Adaptive Software | XM_0128 | 6 | 400 | |

| | | | |
|---|---|---|---|
| Software Language Engineering | XM_0172 | 6 | 400 |
| Software Testing | X_400439 | 6 | 400 |
| Projects System Testing | X_405124 | 6 | 400 |

| Foundations of Computing and Concurrency Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Algorithmic Game Theory | XMU_0063 | 6 | 400 |
| Information Theoretic Learning | XMU_0064 | 6 | 400 |
| Advanced Algorithms | XMU_0060 | 6 | 400 |
| Logical Verification | XM_0167 | 6 | 400 |
| Functional Programming | XMU_0062 | 6 | 400 |
| Term Rewriting Systems | XM_400121 | 6 | 500 |
| Advanced Logic | X_405048 | 6 | 500 |
| Computational Complexity | XMU_0061 | 6 | 400 |
| Geometric Algorithms | XM_0168 | 6 | 400 |
| Distributed Algorithms | X_400211 | 6 | 500 |

| Big Data Engineering Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Data Preparation | XMU_0058 | 6 | 400 |
| Web Data Processing Systems | XM_40020 | 6 | 400 |
| Data Protection Technologies | XMU_0057 | 6 | 400 |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 |
| Data Mining Techniques | X_400108 | 6 | 400 |

| Computer Systems and Infrastructure Core<br>*Select at least 6 EC* | | | |
|---|---|---|---|
| Individual Systems Practical | XM_405088 | 6 | 500 |
| Advanced Operating Systems | XM_40014 | 6 | 500 |
| Programming Large-scale Parallel Systems | XM_400017 | 6 | 400 |
| Distributed Systems | X_400130 | 6 | 400 |
| Parallel Programming Practical | X_400162 | 6 | 400 |
| Multi-core Processor Systems | XMU_0055 | 6 | 400 |
| Energy-efficient Edge Computing | XMU_0056 | 6 | 400 |
| Accelerator-Centric Computing Eco | XM_0171 | 6 | 400 |

## Article 10.3 Elective units of education

1. The student can take one or more of the following electives without prior consent from the Examination Board:

Advice OLC, (art 7.13a)

| Unit of education | Course code | Nr of EC | Level |
|---|---|---|---|
| Research Project Computer Science | XM_0129 | 6 | 500 |
| Large Research Project Computer Science | XM_0130 | 12 | 500 |
| Literature Study | XM_0131 | 6 | 500 |
| Individual Systems Practical | XM_405088 | 6 | 500 |
| Data Preparation | XMU_0058 | 6 | 400 |
| Introduction to Computational Science | XMU_418111 | 6 | 400 |
| Digitalization and Sustainability | XM_0089 | 6 | 500 |
| Verification for Security | XM_0099 | 6 | 400 |
| Advanced Operating Systems | XM_40014 | 6 | 500 |
| Programming Large-scale Parallel Systems | XM_40017 | 6 | 400 |
| Evolutionary Computing | X_400111 | 6 | 400 |
| Software Security | X_400127 | 6 | 400 |
| Software Asset Management | X_400412 | 6 | 400 |
| Service Oriented Design | X_405061 | 6 | 400 |
| Knowledge Organization | X_405065 | 6 | 500 |
| Green Lab | X_418158 | 6 | 500 |
| Advanced Algorithms | XMU_0060 | 6 | 400 |
| Dynamic Programming and Reinf L | XM_0093 | 6 | 400 |
| Network Security | XM_0100 | 6 | 400 |
| Digital Architecture | XM_0127 | 6 | 400 |
| Fundamentals of Adaptive Software | XM_0128 | 6 | 400 |
| Web Data Processing Systems | XM_40020 | 6 | 400 |
| Distributed Systems | X_400130 | 6 | 400 |
| The Social Web | X_405086 | 6 | 400 |
| Performance of Networked Systems | X_405105 | 6 | 400 |
| E-Commerce Law | R_E.commerc | 6 | 500 |
| High Performance Computing and Big Data | XMU_40013 | 6 | 400 |
| Security Experiments and Measurements | XM_0098 | 6 | 400 |
| History of Digital Cultures | XM_0134 | 6 | 400 |
| Security and Machine Learning | XM_0135 | 6 | 500 |
| Parallel Programming Practical | X_400162 | 6 | 400 |
| Cryptographic Engineering | XMU_0047 | 6 | 400 |
| Multi-core Processor Systems | XMU_0055 | 6 | 400 |
| Data Protection Technologies | XMU_0057 | 6 | 400 |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 |
| Entrepreneurship in Analyt and AI | XM_0090 | 6 | 400 |
| Systems Seminar | XM_0122 | 6 | 600 |
| Software Language Engineering | XM_0172 | 6 | 400 |

| | | | | |
|---|---|---|---|---|
| Term Rewriting Systems | XM_400121 | 6 | 500 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Advanced Logic | X_405048 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| Energy-efficient Edge Computing | XMU_0056 | 6 | 400 | |
| ICT for the Global South | XM_0142 | 6 | 400 | |
| Accelerator-Centric Computing Eco | XM_0171 | 6 | 400 | |
| Data Mining Techniques | X_400108 | 6 | 400 | |
| Distributed Algorithms | X_400211 | 6 | 500 | |
| Software Testing | X_400439 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| ICT for the Global North | XM_0143 | 6 | 400 | |
| Machine Learning for the Quantified Self | XM_40012 | 6 | 500 | |
| Project Systems Testing | X_405124 | 6 | 400 | |
| Logical Verification | XM_0167 | 6 | 400 | |
| Geometric Algorithms | XM_0168 | 6 | 400 | |
| Computational Complexity | XMU_0061 | 6 | 400 | |
| Functional Programming | XMU_0062 | 6 | 400 | |
| Algorithmic Game Theory | XMU_0063 | 6 | 400 | |
| Information Theoretic Learning | XMU_0064 | 6 | 400 | |
| Secure Computation | XMU_0065 | 6 | 400 | |
| 2. If the student wishes to take a different unit of education than listed, advance permission must be obtained in writing from the Examinations Board. | | | | |

### Article 10.4 Practical exercise

Not applicable

### Article 10.5 Participation in practical training and tutorials

| | |
|---|---|
| 1. In the case of practical exercises, there may be attendance requirements. Should students not meet these attendance requirements, they must repeat the practical exercise, or the Examination board may issue one or more supplementary assignments. For details on attendance requirements, please refer to the study guide of the relevant unit of study. | Approval OLC (7.13 d) |
| 2. In the case of tutorials, there may be attendance requirements. Should students not meet these attendance requirements, they must repeat the tutorial, or the Examination board may issue one or more supplementary assignments. For details on attendance requirements, please refer to the study guide of the relevant unit of study. | Approval OLC (7.13 d) |
| 3. For thesis and internship, the programme applies the guidelines as stipulated in the Thesis and Placement Regulations. | |

# 11. Evaluation and transitional provisions

## Article 11.1 Evaluation of the education

| | |
|---|---|
| 1. The education provided in this programme is evaluated in accordance with the document 'Kwaliteitszorg Onderwijs BETA'. | Approval OLC (7.13 a1) |

## Article 11.2 Transitional provisions

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

   - The below elective courses are no longer offered starting from the academic year 2024-2025.
     - ICT4D X_405101
     - ICT4D in the Field XM_0008
     - Industrial Internship XM_405080

     Students should take a different elective course instead.

   - Starting from the academic year 2024/2025, students have to choose 4 courses out of the core courses provided for their track (on average, each core includes 6 courses of 6 EC in total). Students who started before 2024/2025 and have accumulated 30 EC or less are encouraged to switch to the new curriculum. All courses included in the previous curriculum are still available in 2024/2025.

   - The Computer Systems Security (CSS) track of the Master Computer Science will be terminated on January 31, 2025; no diplomas will be issued after February 1, 2025. The CSS track includes the following courses:

Advice OLC (7.13 a)

| **Track Computer Systems Security** | | | |
|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** |
| *Year 1* | | | |
| Software Security | X_400127 | 6 | 400 |
| Distributed Algorithms | X_400211 | 6 | 500 |
| Binary and Malware Analysis | X_4051006 | 6 | 500 |
| | | | |
| *Year 2* | | | |
| Advanced Operating Systems | XM_40014 | 6 | 400 |
| Hardware Security | XM_40019 | 6 | 500 |
| Master Project Computer Science | XM_0011 | 30 | 500 |
| Literature Study | XM_0131 | 6 | 400 |
| | | | |
| *Constrained choice (students must obtain at least 6 EC of each theme below)* | | | |
| Foundations of Computation and Concurrency (students must choose at least 6 EC) | | | |
| Protocol Validation | X_400117 | 6 | 500 |
| Logical Verification | X_400115 | 6 | 500 |
| Distributed Algorithms | X_400211 | 6 | 500 |
| Advanced Logic | X_405048 | 6 | 500 |
| | | | |
| Mathematics (students must choose at least 6 EC) | | | |

| | | | |
|---|---|---|---|
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 |
| Coding and Cryptography | X_405041 | 6 | 500 |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 |
| | | | |
| Software Engineering (students must choose at least 6 EC) | | | |
| Software Asset Management | X_400412 | 6 | 400 |
| Service Oriented Design | X_405061 | 6 | 400 |
| Digital Architecture | XM_0127 | 6 | 400 |
| Software Testing | X_400439 | 6 | 400 |
| | | | |
| Societal Perspectives on Computer Science (students must choose at least 6 EC) | | | |
| History of digital cultures | XMU_418107 | 6 | 400 |
| Entrepreneurship in Analytics and AI | XM_0090 | 6 | 400 |
| E-Commerce Law | R_E.commerc | 6 | 500 |
| ICT4D | X_405101 | 6 | 400 |
| ICT4D in the field | XM_0008 | 6 | 400 |

- The Internet and Web Technology (IWT) track of the Master Computer Science will be terminated on January 31, 2026; no diplomas will be issued after February 1, 2026. The PCS track includes the following courses:

| **Track Internet and Web Technology** | | | | Advice OLC; (7.13 a) |
|---|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | |
| *Year 1* | | | | |
| Storage Systems | XM_0092 | 6 | 400 | |
| Distributed Systems | X_400130 | 6 | 400 | |
| Advanced Computer Networks | X_405082 | 6 | 400 | |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 | |
| Distributed Algorithms | X_400211 | 6 | 500 | |
| | | | | |
| *Year 2* | | | | |
| Master Project Computer Science | XM_0011 | 30 | 500 | |
| | | | | |
| *Constrained choice (students must obtain at least 6 EC of each theme below)* | | | | |
| Mathematics (students must choose at least 6 EC) | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| | | | | |
| Software Engineering (students must choose at least 6 EC) | | | | |
| Software Asset Management | X_400412 | 6 | 400 | |

| | | | | |
|---|---|---|---|---|
| Service Oriented Design | X_405061 | 6 | 400 | |
| Digital Architecture | XM_0127 | 6 | 400 | |
| Software Testing | X_400439 | 6 | 400 | |
| | | | | |
| Societal Perspectives on Computer Science (students must choose at least 6 EC) | | | | |
| History of digital cultures | XMU_418107 | 6 | 400 | |
| Entrepreneurship in Analytics and AI | XM_0090 | 6 | 400 | |
| E-Commerce Law | R_E.commerc | 6 | 500 | |
| ICT4D | X_405101 | 6 | 400 | |
| ICT4D in the field | XM_0008 | 6 | 400 | |
| | | | | |
| Security (students must choose at least 6 EC) | | | | |
| Software Security | X_400127 | 6 | 400 | |
| Network Security | XM_0100 | 6 | 400 | |
| Security Experiments and Measurements | XM_0098 | 6 | 400 | |
| Verification for Security | XM_0099 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| Cryptographic Engineering | XMU_0047 | 6 | 400 | |
| | | | | |
| Research Skills (students must choose at least 6 EC) | | | | |
| Research Project Computer Science | XM_0129 | 6 | 500 | |
| Literature Study | XM_0131 | 6 | 500 | |

- The Parallel Computing Systems (PCS) track of the Master Computer Science will be terminated on January 31, 2026; no diplomas will be issued after February 1, 2026. The PCS track includes the following courses:

| **Track Parallel Computing Systems** | | | | |
|---|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | |
| *Year 1* | | | | |
| Programming Large-scale Parallel Systems | XM_40017 | 6 | 400 | |
| Parallel Programming Practical | X_400162 | 6 | 400 | |
| Web Services and Cloud-Based Systems | XMU_418110 | 6 | 400 | |
| Energy-efficient Edge Computing | XMU_0056 | 6 | 500 | |
| | | | | |
| *Year 2* | | | | |
| Multi-core Processor Systems | XMU_0055 | 6 | 400 | |
| Master Project Computer Science | XM_0011 | 30 | 500 | |
| | | | | |
| *Constrained choice (students must obtain at least 6 EC of each theme below)* | | | | |
| Foundations of Computation and Concurrency (students must choose at least 6 EC) | | | | Advice OLC; (7.13 a) |

| | | | | |
|---|---|---|---|---|
| Protocol Validation | X_400117 | 6 | 500 | |
| Logical Verification | X_400115 | 6 | 500 | |
| Distributed Algorithms | X_400211 | 6 | 500 | |
| Advanced Logic | X_405048 | 6 | 500 | |
| | | | | |
| Mathematics (students must choose at least 6 EC) | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| | | | | |
| Software Engineering (students must choose at least 6 EC) | | | | |
| Software Asset Management | X_400412 | 6 | 400 | |
| Service Oriented Design | X_405061 | 6 | 400 | |
| Digital Architecture | XM_0127 | 6 | 400 | |
| Software Testing | X_400439 | 6 | 400 | |
| | | | | |
| Societal Perspectives on Computer Science (students must choose at least 6 EC) | | | | |
| History of digital cultures | XMU_418107 | 6 | 400 | |
| Entrepreneurship in Analytics and AI | XM_0090 | 6 | 400 | |
| E-Commerce Law | R_E.commerc | 6 | 500 | |
| ICT4D | X_405101 | 6 | 400 | |
| ICT4D in the field | XM_0008 | 6 | 400 | |
| | | | | |
| Security (students must choose at least 6 EC) | | | | |
| Software Security | X_400127 | 6 | 400 | |
| Network Security | XM_0100 | 6 | 400 | |
| Security Experiments and Measurements | XM_0098 | 6 | 400 | |
| Verification for Security | XM_0099 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| Cryptographic Engineering | XMU_0047 | 6 | 400 | |
| | | | | |
| Research Skills (students must choose at least 6 EC) | | | | |
| Research Project Computer Science | XM_0129 | 6 | 500 | |
| Literature Study | XM_0131 | 6 | 500 | |

The SLA track (Systems for Large-Scale Applications) will be terminated on August 31, 2026. No diplomas will be issued starting from September 1, 2026. The SLA track includes the following courses:

| **Track Systems for Large-Scale Applications** | | | | Advice OLC; (7.13 a) |
|---|---|---|---|---|
| **Unit of education** | **Course code** | **Nr of EC** | **Level** | |

| | | | | |
|---|---|---|---|---|
| *Year 1* | | | | |
| Programming Large-scale Parallel Systems | XM_40017 | 6 | 400 | |
| Distributed Systems | X_400130 | 6 | 400 | |
| Parallel Programming Practical | X_400162 | 6 | 400 | |
| Web Services and Cloud-based Systems | XMU_418110 | 6 | 400 | |
| Distributed Algorithms | X_400211 | 6 | 500 | |
| | | | | |
| *Year 2* | | | | |
| Master Project Computer Science | XM_0011 | 30 | 500 | |
| | | | | |
| *Constrained choice (students must obtain at least 6 EC of each theme below)* | | | | |
| Mathematics (students must choose at least 6 EC) | | | | |
| Dynamic Programming and Reinforcement Learning | XM_0093 | 6 | 400 | |
| Performance of Networked Systems | X_405105 | 6 | 400 | |
| Coding and Cryptography | X_405041 | 6 | 500 | |
| Experimental Design and Data Analysis | X_405078 | 6 | 400 | |
| | | | | |
| Software Engineering (students must choose at least 6 EC) | | | | |
| Software Asset Management | X_400412 | 6 | 400 | |
| Service Oriented Design | X_405061 | 6 | 400 | |
| Digital Architecture | XM_0127 | 6 | 400 | |
| Software Testing | X_400439 | 6 | 400 | |
| | | | | |
| Societal Perspectives on Computer Science (students must choose at least 6 EC) | | | | |
| History of digital cultures | XMU_418107 | 6 | 400 | |
| Entrepreneurship in Analytics and AI | XM_0090 | 6 | 400 | |
| E-Commerce Law | R_E.commerc | 6 | 500 | |
| ICT4D | X_405101 | 6 | 400 | |
| ICT4D in the field | XM_0008 | 6 | 400 | |
| | | | | |
| Security (students must choose at least 6 EC) | | | | |
| Software Security | X_400127 | 6 | 400 | |
| Network Security | XM_0100 | 6 | 400 | |
| Security Experiments and Measurements | XM_0098 | 6 | 400 | |
| Verification for Security | XM_0099 | 6 | 400 | |
| Software Threat Analysis | XM_0124 | 6 | 400 | |
| Cryptographic Engineering | XMU_0047 | 6 | 400 | |
| | | | | |
| Research Skills (students must choose at least 6 EC) | | | | |
| Research Project Computer Science | XM_0129 | 6 | 500 | |
| Literature Study | XM_0131 | 6 | 500 | |

| | |
|---|---|
| | |

Approval of the Programme Committee of the curriculum structure (submitted via UAS), on 14-02-2024.

Advice and approval by the Programme Committee (with the exception of the curriculum structure), on 19-08-2024.

Approved by the Faculty Joint Assembly, on 22-08-2024.

Adopted by the board of the Faculty of Sciences on 23-08-2024.

# Appendix I

## Overview of articles that must be included in the OER

*Based on Article 7.13, paragraph 2, of the WHW and other Articles of the Act.*

Section A: Faculty section

| | |
|---|---|
| **2. Study programme structure** | |
| Article 2.1 Structure of academic year and units of education | 7.13 paragraph 2 sub e |
| **3. Assessment and examination** | |
| Article 3.2 Type of examination | 7.13 paragraph 2 sub h, l, j |
| Article 3.3 Oral examinations | 7.13 paragraph 2 sub l, n |
| Article 3.4 Determining and announcing results | 7.13 paragraph 2 sub o |
| Article 3.5 Examination opportunities | 7.13 paragraph 2 sub h, j |
| Article 3.7 Exemption | 7.13 paragraph 2 sub r |
| Article 3.8 Validity period for results | 7.13 paragraph 2 sub k |
| Article 3.9 Right of inspection and post-examination discussion | 7.13 paragraph 2 sub p, q |
| **4. Academic student counselling and study progress** | |
| Article 4.1 Administration of study progress and academic student counselling | 7.13 paragraph 2 sub u |
| Article 4.2 Facilities for students with a disability | 7.13 paragraph 2 sub m |

Section B1: Programme specific – general provisions

| | |
|---|---|
| **6. General programme information and characteristics** | |
| Article 6.1 Study programme information | 7.13 paragraph 2 sub i, r |
| Article 6.2 Teaching formats used and modes of assessment | 7.13 paragraph 2 sub l, x |
| [option:] Article 6.3 Academic student counselling | 7.13 paragraph 2 sub u |
| **7. Further admission requirements** | |
| Article 7.2 Admission requirements | 7.30b paragraph 1 |
| Article 7.3 Selection criteria | 7.30b paragraph 2, 5 |
| **8. Examinations and results** | |
| Article 8.1 Sequence of examinations | 7.13 paragraph 2 sub h, s, t |
| [option 1:] Article 8.2 Validity period for results | 7.13 paragraph 2 sub k |
| [option 2:] Article 8.2 Validity period for results | 7.13 paragraph 2 sub k |

Section B2: Programme specific – content of programme

| | |
|---|---|
| **9. Programme objectives, tracks/specialisations, exit qualifications and language** | |
| Article 9.1 Workload | 7.13 paragraph 2 sub g |
| Article 9.2 Tracks and/or specialisations | 7.13 paragraph 2 sub a |
| Article 9.3 Programme objective | 7.13 paragraph 2 sub a |
| Article 9.4 Exit qualifications | 7.13 paragraph 2 sub b, c |
| Article 9.5 Language of instruction | 9.18 (*implementation expected in 2020*) |
| **10. Curriculum structure** | |
| Article 10.1 Composition of the programme | 7.13 paragraph 2 sub a |
| Article 10.2 Compulsory units of education | 7.13 paragraph 2 sub a |
| [Optional] Article 10.3 Elective units of education | 7.13 paragraph 2 sub a |
| [Optional] Article 10.4 Practical exercise | 7.13 paragraph 2 sub d |
| Article 10.5 Participation in practical training and tutorials | 7.13 paragraph 2 sub d |
| **11. Evaluation and transitional provisions** | |
| Article 11.1 Evaluation of the education | 7.13 paragraph 2 sub a1 |
| Article 11.2 Transitional provisions | 7.13 paragraph 2 sub a |

# Appendix II
# Overview of advisory and approval rights of Programme Committees (OLC) and Faculty Joint Assembly (FGV)

*(English below)*

| Onderwerpen Onderwijs – en Examenregeling (OER) 7.13 lid 2 WHW | FGV | | OplC | |
|---|---|---|---|---|
| | I | A | I | A |
| a. de inhoud van de opleiding en van de daaraan verbonden examens | | | | |
| a1. de wijze waarop het onderwijs in de desbetreffende opleiding wordt geëvalueerd | | | | |
| b. de inhoud van de afstudeerrichtingen binnen een opleiding | | | | |
| c. de kwaliteiten op het gebied van kennis, inzicht en vaardigheden die een student zich bij beëindiging van de opleiding moet hebben verworven | | | | |
| d. waar nodig, de inrichting van praktische oefeningen | | | | |
| e. de studielast van de opleiding en van elk van de daarvan deel uitmakende onderwijseenheden | | | | |
| f. de nadere regels, bedoeld in de artikelen 7.8b, zesde lid, en 7.9, vijfde lid *(BSA)* | | | | |
| g. ten aanzien van welke masteropleidingen toepassing is gegeven aan artikel 7.4a, achtste lid *(verhoogde studielast)* | | | | |
| h. het aantal en de volgtijdelijkheid van de tentamens alsmede de momenten waarop deze afgelegd kunnen worden | | | | |
| i. de voltijdse, deeltijdse of duale inrichting van de opleiding | | | | |
| j. waar nodig, de volgorde waarin, de tijdvakken waarbinnen en het aantal malen per studiejaar dat de gelegenheid wordt geboden tot het afleggen van de tentamens en examens | | | | |
| k. waar nodig, de geldigheidsduur van met goed gevolg afgelegde tentamens, behoudens de bevoegdheid van de examencommissie die geldigheidsduur te verlengen | | | | |
| l. of de tentamens mondeling, schriftelijk of op een andere wijze worden afgelegd, behoudens de bevoegdheid van de examencommissie in bijzondere gevallen anders te bepalen | | | | |
| m. de wijze waarop studenten met een handicap of chronische ziekte redelijkerwijs in de gelegenheid worden gesteld de tentamens af te leggen | | | | |
| n. de openbaarheid van mondeling af te nemen tentamens, behoudens de bevoegdheid van de examencommissie in bijzondere gevallen anders te bepalen | | | | |
| o. de termijn waarbinnen de uitslag van een tentamen bekend wordt gemaakt alsmede of en op welke wijze van deze termijn kan worden afgeweken | | | | |
| p. de wijze waarop en de termijn gedurende welke degene die een schriftelijk tentamen heeft afgelegd, inzage verkrijgt in zijn beoordeelde werk | | | | |
| q. de wijze waarop en de termijn gedurende welke kennis genomen kan worden van vragen en opdrachten, gesteld of gegeven in het kader van een schriftelijk afgenomen tentamen en van de normen aan de hand waarvan de beoordeling heeft plaatsgevonden | | | | |
| r. de gronden waarop de examencommissie voor eerder met goed gevolg afgelegde tentamens of examens in het hoger onderwijs, dan wel voor buiten het hoger onderwijs opgedane kennis of vaardigheden, vrijstelling kan verlenen van het afleggen van een of meer tentamens | | | | |
| s. waar nodig, dat het met goed gevolg afgelegd hebben van tentamens voorwaarde is voor de toelating tot het afleggen van andere tentamens | | | | |
| t. waar nodig, de verplichting tot het deelnemen aan praktische oefeningen met het oog op de toelating tot het afleggen van het desbetreffende tentamen, behoudens de bevoegdheid van de examencommissie vrijstelling van die verplichting te verlenen, al dan niet onder oplegging van vervangende eisen | | | | |
| u. de bewaking van studievoortgang en de individuele studiebegeleiding | | | | |
| v. indien van toepassing: de wijze waarop de selectie van studenten voor een speciaal traject binnen een opleiding, bedoeld in artikel 7.9b, plaatsvindt *(excellentietraject binnen een opleiding)* | | | | |
| x. de feitelijke vormgeving van het onderwijs | | | | |
| *alle overige onderwerpen die in de OER zijn geregeld maar die niet als zodanig zijn genoemd in art. 7.13 WHW onder a t/m x.* | | | | |

*De lettering komt overeen met de lettering van artikel 7.13 lid 2 WHW*

**Afkortingen:**

FGV: Facultaire Gezamenlijke Vergadering
OplC: Opleidingscommissie
I: Instemmingsrecht
A: Adviesrecht

# Appendix II (English)

## Overview of advisory and approval rights of Programme Committees (OLC) and Faculty Joint Assembly (FGV)

*Disclaimer: this is a translation which only serves as an aid. No rights may be derived from it. The Dutch document prevails.*

| Article 7.13, paragraph 2, of the Higher Education and Research Act | FGV | | OplC | |
|---|---|---|---|---|
| | I | A | I | A |
| a. content of the programme and associated examinations | | | | |
| a1. the manner in which teaching and education in the relevant programme are evaluated | | | | |
| b. the content of the specialisations offered as part of the programme | | | | |
| c. the programme's final attainment levels with regard to the knowledge, understanding and skills | | | | |
| d. where applicable, the design of practical exercises | | | | |
| e. the workload of the programme and of each of its constituent educational units | | | | |
| f. the detailed rules referred to in Article 7.8b, sixth paragraph, and Article 7.9, fifth paragraph (recommendation on continuation of studies) | | | | |
| g. the Master's programmes to which Article 7.4a, eighth paragraph, applies (elevated workload) | | | | |
| h. the number and sequence of examinations and the times at which these can be taken | | | | |
| i. the full-time, part-time or work-study structure of the programme | | | | |
| j. where necessary, the order in which students can take the examinations and the final examinations for Bachelor's and Master's programmes, as well as the timing of and number of opportunities | | | | |
| k. where necessary, the period of validity for pass grades awarded for examinations, notwithstanding the authority of the Examination Board to extend this period of validity | | | | |
| l. whether examinations are administered in oral, written or another form, notwithstanding the authority of the Examination Board to decide otherwise | | | | |
| m. the way in which students with a disability or chronic health condition are given a reasonable opportunity to take the examinations | | | | |
| n. the public nature of oral examinations, subject to the right of the Examination Board to determine otherwise in special cases | | | | |
| o. the period within which the results of an examination must be announced, together with details of whether this period can be altered and if so in what way | | | | |
| p. the way in which and the period within which students who have taken an examination are given the opportunity to inspect their marked work | | | | |
| q. the way in which and the period within which information can be provided about the questions asked and exercises given in the framework of a written examination and about the standards used for assessment | | | | |
| r. the grounds on which the Board of Examiners may grant exemptions from taking one or more examinations on the basis of examinations and final examinations for Bachelor's and Master's programmes previously completed in higher education, or on the basis of knowledge or skills acquired outside higher education | | | | |
| s. where necessary, the stipulation that students must pass certain examinations as a condition for admission to other examinations | | | | |
| t. where necessary, the obligation to take part in certain practical exercises with a view to admission to the examination in question, subject to the authority of the Examination Board to grant exemption from this obligation, with or without the imposition of alternative requirements | | | | |
| u. the monitoring of academic progress and individual student support and guidance | | | | |
| v. where applicable, the manner in which students are selected for a special track within a programme as referred to in Article 7.9b (excellence track within a programme) | | | | |
| x. the actual design of the education provided | | | | |
| *All other matters that are regulated in the Academic and Examination Regulations but which are not mentioned as such in Article 7.13 of the Higher Education and Research Act under points a to x.* | | | | |

**Abbreviations used:**

FGV: Faculty Joint Assembly
OplC: Programme Committee
I: right of approval
A: right of advice

# Appendix III
# Ordinances VU CvB and Binding Guidelines (richtlijn)

| Section A, article: | Concerns: | CvB ordinance / guideline |
|---|---|---|
| 2.1.1, 2.1.2 | Year planning two semesters 8-8-4<br>(uniform year calendar VU-UvA) | 29-9-2008 (period 2009-2015) 22-05-2014 (period 2016-2025) |
| 2.1.3, 2.1.4 | Units of education | Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 |
| 3.1 | Signing up for education and examinations | CvB ordinance 30-09-2010, prior consent USR. |
| 3.4.1 | Determination and publication of the results<br>(1) Grading deadline exams ten working days<br>(2) Theses twenty working days | (1) Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017<br>((2) Quality demand 11 from the VU assessment policy, CvB ordinance 15-05-2012 |
| 3.5.1 | Two possibilities to take examinations per year | Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 |
| 3.5.2 | Retake:<br>Most recent grade is valid<br>A pass can be retaken | Taken from the UvA guidelines, as part of the harmonization, CvB ordinance 24-02-2014 |
| 3.5.4 | One-time extra resit in relation to examination requirement | Included in (prior) model OER 16-17 following a request from committee O&O and adopted by CvB op 27-10-2015 |
| 3.6 | Grades | CvB ordinance 30-09-2010, with University council's consent. As a result of harmonization UvA, the guideline: 5.5 is a pass, has been added. CvB ordinance 24-02-2014. |
| **Section B1, article:** | **Concerns:** | **CvB ordinance / guideline** |
| 7.2 | Admission criteria; at least WO Bachelor's degree | Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 |
| 7.3 | Selection criteria; type of criteria | Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 |
| **Section B1, article:** | **Concerns:** | **CvB ordinance / guideline** |
| 10.1 | Composition programme | Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 |
| 10.2 | Categorization of units | Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 |

# Appendix IV
# Article 2.1 of the Higher Education and Research (Implementation) Act (Uitvoeringsbesluit)

*(English below)*

1. 1 De persoonlijke omstandigheden bedoeld in de artikelen 7.8b, derde lid, en 7.9, derde lid, van de wet, zijn uitsluitend:

   a) ziekte van betrokkene,
   b) lichamelijke, zintuiglijke of andere functiestoornis van betrokkene,
   c) zwangerschap van betrokkene,
   d) bijzondere familie-omstandigheden,
   e) het lidmaatschap, daaronder begrepen het voorzitterschap, van:
      1. bij universiteiten: de universiteitsraad, faculteitsraad, het orgaan dat is ingesteld op grond van de medezeggenschapsregeling, bedoeld in artikel 9.30, derde lid, onderscheidenlijk artikel 9.51, tweede lid, van de wet, het bestuur van een opleiding of de opleidingscommissie, alsmede het lidmaatschap van het bestuur van een stichting die blijkens haar statuten tot doel heeft de exploitatie van voorzieningen, behorende tot de studentenvoorzieningen, dan wel van een daarmee naar het oordeel van het instellingsbestuur gelet op de taak gelijk te stellen orgaan,

      2. bij hogescholen: de medezeggenschapsraad, deelraad, studentencommissie of opleidingscommissie.

   f) andere in de regelingen, bedoeld in de artikelen 7.8b, zesde lid, en 7.9, vijfde lid, van de wet door het instellingsbestuur aan te geven omstandigheden waarin betrokkene activiteiten ontplooit in het kader van de organisatie en het bestuur van de zaken van de instelling,
   g) het lidmaatschap van het bestuur van een studentenorganisatie van enige omvang met volledige rechtsbevoegdheid, dan wel van een vergelijkbare organisatie van enige omvang, bij wie de behartiging van het algemeen maatschappelijk belang op de voorgrond staat en die daartoe daadwerkelijk activiteiten ontplooit.
   h) andere in de onderwijs- en examenregeling, bedoeld in artikel 7.13 van de wet, op grond van artikel 7.13, tweede lid, onderdeel f, van de wet, vast te leggen persoonlijke omstandigheden,
   i) andere dan in de onderdelen a tot en met h bedoelde persoonlijke omstandigheden die, indien zij door het instellingsbestuur niet in de beoordeling zouden worden betrokken, zouden leiden tot een onbillijkheid van overwegende aard.

2. Het instellingsbestuur kan voor de toepassing van het eerste lid, onderdeel g, nadere regels vaststellen omtrent het aantal bestuursleden dat ten hoogste per organisatie per studiejaar in aanmerking komt, zomede omtrent welke bestuursfuncties in aanmerking komen.

# Appendix IV (English)

## Article 2.1 of the Higher Education and Research (Implementation) Act

*Disclaimer: This is a translation which only serves as an aid. No rights may be derived from it. The Dutch document prevails.*

1. The extenuating personal circumstances referred to in Article 7.8b, paragraph 3 and 7.9, paragraph 3 of the Act (WHW) are limited to:

   a) illness of the person concerned,
   b) physical, sensory or other impairment of the person concerned,
   c) pregnancy of the person concerned,
   d) extenuating family circumstances,
   e) membership, including the chairmanship of:

      1. universities: the university council, faculty council, the body established under the participation regulation referred to in Article 9.30, paragraph 3, or Article 9.51, paragraph 2, of the Act, the programme management or the programme committee, or membership on the board of a foundation whose bylaws allow for the exploitation of facilities belonging to the student services, or an equivalent body with regard to its activities in the opinion of the board of the institution,
      2. universities of applied sciences: the participation council, district council, student committee or programme committee,

   f) other circumstances to be designated by the board of the institution in the regulation as referred to in Article 7.8b, paragraph 6, and Article 7.9, paragraph 5, of the Act in which the person concerned engages in activities within the framework of the organization and the administration of the affairs of the institution,
   g) membership on the board of a student organization of a certain size with full legal capacity, or a similar organization of a certain size, whose primary task regards general societal interest and which actually develops activities for this purpose,
   h) other personal circumstances set out in the Teaching and Examination Regulations as referred to in Article 7.13 of the Act, pursuant to Article 7.13, paragraph 2, clause f of the Act,
   i) personal circumstances other than those referred to in a – h above which, if overlooked by the governing bodies of the institution, would lead to an obviously unfair outcome.

2. The institutional board may, for the purposes of the first paragraph, part g, establish specific rules regarding the maximum number of eligible board members per organization per academic year, as well as the eligible administrative offices.