

# **Education and Examination Regulation 2018-2019**

## **Bachelor Computing Science**

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## **PART I      GENERAL PROVISIONS**

### **Section 1.    General provisions**

#### **Article 1.1      Applicability of these regulations**

1. These Education and Examination Regulations (EER) apply to the Bachelor's programmes of the Faculty of Science and outline the applicable procedures, rights and obligations concerning teaching, interim examinations and final examinations.
2. The present regulations apply to all students enrolled in a Faculty of Science degree programme in the academic year 2018-2019. Students who enrolled in their programme before 1 September 2017 should appeal to the EER in effect at the time of their first enrolment for the programme, if they have continuously been enrolled.
3. The faculty offers the following Bachelor's programmes:
  - a. Biology;
  - b. Computing Science and Information Science;
  - c. Molecular Life Sciences;
  - d. Natuur- en Sterrenkunde;
  - e. Chemistry;
  - f. Science;
  - g. Wiskunde.
4. The degree programmes have a study load of 180 EC: the propedeutic phase corresponds with the first academic year and has a study load of 60 EC; the core (post-propedeutic) programme has a study load of 120 EC.
5. All degree programmes are offered exclusively as full-time programmes.
6. The Molecular Life Sciences and Chemistry programmes are taught in English. Other programmes have English components. An overview can be found in Article 7.2.

#### **Article 1.2      Definitions**

1. The terms used in these EER, which are also used in the Higher Education and Research Act (Wet op het hoger onderwijs en wetenschappelijk onderzoek, hereinafter, "the Act") will have the same meaning as in the Act.
2. Apart from the terms referred to in paragraph 1, the terms below will be understood to have the following meaning:
  - a. Degree programme: the Bachelor's programme referred to in Article 7.3a, paragraph 1 of the Act;
  - b. Component: an educational unit as referred to in Article 7.3, paragraphs 2 and 3 of the Act;
  - c. Student: anyone enrolled at Radboud University for participation in a degree programme and/or in the courses or final examinations of a programme;
  - d. First year: the foundational year (propedeutic phase) of the programme, as referred to in Article 7.8 of the Act;
  - e. Academic year: the period of time from 1 September until 31 August the next calendar year;
  - f. Practical exercise: a practical exercise as referred to in Art. 7.13 paragraph 2 under D of the Act;

- g. Interim examination: an examination testing the knowledge, understanding and skills of the student in relation to a certain unit of study, as well as the assessment of this examination, which is administered by at least one examiner designated by the Examination Board;
- h. Final examination: an examination of the student's academic achievements, in which the Examination Board determines whether or not all examinations that are part of the Bachelor's (propedeutic and core phase) programme have been successfully completed. The Examination Board may determine that this review requires a test of the candidate's knowledge, understanding and skills by the Examination Board itself and an assessment of the results of that test (in accordance with Article 7.10 of the Act);
- i. Fraud: every (lack of) action by a student aimed, or partially aimed, at making it impossible to accurately assess the knowledge, insight, and skills of the student, or of another student;
- j. Examination Board: the examination committee of a degree programme, established in accordance with Article 7.12 of the Act. Also see the Radboud University Structural Regulations;
- k. Examiner: the person designated by the Examination Board to administer the interim examination, in accordance with Article 7.12 of the Act;
- l. EC: European Credits, i.e. the study load unit in accordance with the European Credit Transfer System. One EC is equal to 28 hours of study;
- m. Work day: Mondays to Fridays, with the exception of official holidays and any other days marked by Radboud University as collective holidays;
- n. Awarding of the degree certificate: the formal confirmation that all the examination requirements have been met;
- o. Study guide: the guide for a particular degree programme of the Faculty of Science, containing specific information for the Bachelor's programme;
- p. The university: Radboud University;
- q. The faculty: The Faculty of Science;
- r. Minor: a cohesive selection of components;
- s. Free elective: a freely selected, academic, assessable component.
- t. Double Bachelor's: an excellence programme where a student follows two Faculty of Science Bachelor's programmes simultaneously.

## **PART II      PROVISIONS APPLICABLE TO ALL BACHELOR'S PROGRAMMES**

### **Section 2.    Access to the degree programmes and education**

#### **Article 2.1      Prior education requirements**

To be admitted to the programme, the student must meet the statutory (additional) prior education requirements set out by the Act.

#### **Article 2.2      Replacement requirements for insufficient prior education**

The student who has a pre-university education diploma that does not meet the prior education requirements referred to in Article 2.1, may still enrol, with due observance of the provisions of Article 7.25 paragraph 5 of the Act, on the condition that comparable requirements have been met in terms of content and subject to further assessment. The assessment procedure and the requirements are outlined in the programme-specific part of these regulations.

#### **Article 2.3      Language requirements**

1. A sufficient command of the Dutch language is required to participate in courses and examinations taught or given in Dutch. Non-Dutch students have met the language requirement for sufficient proficiency in Dutch if they have passed the state examination of Dutch as a second language, level 2. The Examination Board may in certain cases assess whether a student has sufficient proficiency in Dutch.
2. A sufficient command of the English language is required to participate in the programme and possibly to sit for examinations in English. This requirement is met if the student:
  - a. is from an English-speaking country. The Faculty of Science understands the following countries to be English-speaking countries: Australia, Canada (with the exception of Quebec), Ireland, New Zealand, Singapore, South Africa, the United Kingdom, and the United States of America; or
  - b. has a diploma for pre-university education (VWO); or
  - c. has a diploma for pre-university education obtained at an English-language institution in the Netherlands or abroad; or
  - d. has a diploma for pre-university education obtained at a German secondary education institution, with English as Grundkurs; or
  - e. has a Bachelor's diploma for a university of applied sciences (HBO); or
  - f. has a Bachelor's diploma earned at a Dutch university; or
  - g. een van de onderstaande toetsen heeft afgelegd:
    - i. the TOEFL with a score of 575 or higher for the paper version;
    - ii. the TOEFL with a score of 90 or higher for the Internet version, with no sub-scores lower than an 18;
    - iii. the IELTS with a score of 6.5 or higher, with no sub-scores lower than a 6,0;



- iv. the Cambridge CAE or CPE with a score of C or higher.
- 1. In certain cases, the Examination Board may assess whether a student has sufficient proficiency in English.

## Section 3. Structure and design

### Article 3.1 Final examination, degree and distinctions

1. The first year of the degree programme, being the propedeutic phase, concludes with the propedeutic examination. All Bachelor's programmes conclude with a Bachelor's examination.
2. A student who has passed the examination of the Bachelor's degree programme will be awarded the Bachelor of Science (BSc) degree.
3. The degree referred to in the second paragraph, is exclusively awarded if the student has earned at least half of their EC at this university.
4. The examination board can award a distinction to a student who has successfully passed the degree programme examination. The rules for awarding a distinction are to be found in Article 4.7 of this EER.

### Article 3.2 General learning outcomes

1. The degree programme has the following learning outcomes for students:
  - a. Acquire knowledge, skills and insights in the relevant field of study;
  - b. Develop academic competences;
  - c. Preparation for future career.
2. Students who have completed one of the faculty Bachelor's programmes as referred to in Article 7.10a, paragraph 1 of the Act, shall be granted unconditional admission to at least one of the Master's programmes at the university.

### Article 3.3 Curriculum

1. The programme comprises the total of the components as described in the programme-specific part of these regulations and is aimed at the realisation of the objectives described in Article 3.2.1.
2. The Bachelor's programmes comprise a component with a study load of 3 EC with the purpose of reflection on study performance and planning, as well as boosting the development of academic skills.
3. The (post-propedeutic) core programme comprises a free elective component with a minimum study load of 6 EC. The elective courses cannot have a substantial overlap in content with courses from the mandatory component. Courses that overlap with the elective courses within the mandatory programme or in the minor component are also not allowed.
4. Every programme has a minor component of at least 15 ec in which the student can participate in a minor.

5. If a minor is not accessible for students from a specific Bachelor's programme, this will be stated in the programme specific part of these EER.
6. The approval of the Examination Board needs to be requested if a student wants to do a minor which is not offered by Radboud University. Minors offered by Radboud University can be found in the prospectus. This minor will be labelled as a 'free minor' and needs to meet the following requirements:
  - a. The minor encompasses at least 15 ec and at most 30 ec;
  - b. The minor has thematic coherency.
7. The core programme also includes one or more components of a philosophical nature, in total amounting to at least 3 EC, as well as a writing skills component of 3 EC.
8. Finally, the core programme includes an individual final aptitude test (Bachelor's thesis) with a study load of 12 EC.
9. By way of derogation from what is stated in paragraph 8, the Bachelor's thesis can be expanded. This is the case when a student is admitted into the Radboud Honours Academy FNWI. The Bachelor's thesis can then be expanded with an internship, possibly abroad, of which the number of ec is to be determined on the basis of the Radboud Honours Academy FNWI programme. In all other cases where an expansion is possible, this will be stated in the programme specific component of these EER.
10. The composition of the Bachelor's programme compiled by the student must be presented for approval to the Examination Board no later than six months before the expected examination date. The Examination Board will decide whether to grant approval within a month of receiving the submitted programme.

#### **Article 3.4      Sequence of education and interim examinations**

1. For admission to the core programme, students must have successfully completed the first year (propedeutic) examination for the relevant degree programme.
2. Contrary to the first paragraph, students who do not meet the requirements of the propedeutic examination after the first year may already take interim examinations in the second academic year (core programme) if they have earned a minimum of 39 EC during the first year.
3. At the request of the student, the Examination Board may allow him/her to participate in certain components and take certain interim examinations in the core programme if they have earned fewer than 42 EC. This requires the student to create a plan in consultation with the student advisor. On the basis of this plan, the Examination Board will decide on the period of validity of the granted access.
4. The student may not start the final aptitude test (Bachelor's thesis) before the first year examination has been successfully completed and a minimum of 60 EC of the core programme have been obtained.
5. The programme-specific part of these EER may contain further criteria for the order in which components may be taken and the related interim examinations.



### **Article 3.5      Type of interim examination**

1. Each component of the degree programme will be concluded by an interim examination. Interim examinations may comprise more than one modular interim examination and are administered in the following forms:
  - a. Written (paper and/or digitally)
  - b. Oral
  - c. Presentation
  - d. Proficiency test
  - e. The production of a product or text.
2. For each component, the examiner will announce through the prospectus the form in which the interim examinations will be administered prior to the commencement of the academic year. The Examination Board may determine that the type of interim examination be changed from what was stated in the prospectus per request by a student or the examiner. This change cannot disadvantage the student.
3. Students with disabilities are given the opportunity to take interim examinations in a manner appropriately suited to their disability. The Examination Board, if necessary, shall seek expert advice and counsel prior to reaching its decision. If the students in question require certain facilities for their interim examinations, they must request these from the faculty's Education and Examination Administration no later than two weeks before the interim examination.
4. For oral examinations, no more than one person is tested at the same time, unless decided otherwise by the Examination Board.
5. An oral interim examination is not public, unless the Examination Board has deemed otherwise for exceptional cases.
6. Oral interim examinations are administered in the presence of a second examiner or an observer appointed by the Examination Board. In special cases, the Examination Board may require that the oral interim examination be recorded.

### **Article 3.6      Exemptions**

1. At the request of a student and having heard the examiner involved, the Examination Board may exempt the student, either partially or fully, from an interim examination if the student:
  - a. Has passed a course examination in a relevant subject at a university or institute of higher vocational education (HBO)
  - b. Demonstrates that he/she has adequate knowledge and skills regarding the component in question as a result of relevant work experience or professional experience
2. If the programme has generic exemptions, these can be found in the programme specific component of these EER.
3. Students who were first enrolled in 2017/2018 can never have more exemptions, as stated in paragraph 1, than 70 ec.
4. The Bachelor's thesis is an exception to the exemptions stated in paragraph 1.
5. An exception to the rule stated in paragraph 4, a student who does a double Bachelor's can receive an exemption for a Bachelor's thesis if they completed a Bachelor's thesis for another programme within the Faculty of Science.

### **Article 3.7      Term of validity of successfully completed interim examinations**

The term of validity of successfully completed interim examinations is unlimited.

### **Article 3.8      Individual degree programme**

A request for an individual degree programme as stated in Article 7.3d of the Act must be approved by the Examination Board. The Examination Board checks if the programme fits within the domain of the programme, whether there is enough cohesion in the programme, and if the level is high enough to meet the standards of the programme.

## **Section 4.      Examinations**

### **Article 4.1      Frequency of interim examinations**

1. The opportunity to participate in a lab (course) is offered at least once a year.
2. Students are given at least two opportunities per year to take interim examinations.
3. Contrary to the stipulation in the second paragraph, there will be at least one opportunity in the following year to take an interim examination for a course that was taught for the final time in the previous academic year.
4. If a certain component is not given in a particular year, the opportunity to take the corresponding examination will be offered once in that year, as long as the interim examination is administered in written or oral form.

### **Article 4.2      Registration for interim examinations**

1. Students who register through OSIRIS for courses in the programme are also automatically registered for the first interim examination opportunity in the relevant academic year. If a student does not wish to participate in the interim examination, he/she must de-register for the examination via Osiris up to 1 day before the examination date. After the abovementioned time period, the student can only personally deregister directly with the lecturer up until the starting time of the interim examination.
2. The student must register for an interim examination in accordance with the applicable guidelines and instructions, no later than seven days before the interim examination date.

### **Article 4.3      Confirmation of interim examination results**

1. The result of an interim examination is determined by an examiner in the form of a grade on a scale of 1 to 10 (with 10 as the highest possible grade), consisting exclusively of whole number or half numbers. The grade 5.5, however, is never given. When rounding off between 5 and 6, the rule is that a grade lower than 5.5 is rounded down to a five (5) which is an insufficient grade, meaning the educational component has not been successfully completed; while a 5.5 and higher

is rounded up to a six (6), meaning that this educational component has been successfully completed. In addition to results in the form of a grade, the assessments “satisfactory” and “not satisfactory” may also be awarded.

2. If a student re-sits an interim examination, the most recent mark will determine the final result.

#### **Article 4.4 Publication of results**

1. The examiner shall, on the date that an oral interim examination is administered, determine the result and give the student a written statement of this.
2. The examiner shall determine the result of a written interim examination within 10 work days of the date it was administered for interim examinations in the propedeutic phase and within 15 working days for interim examinations in the core phase. The precondition applies that there must be at least 10 work days between the date of the publication of the result in Osiris and the date of the resit. The examiner will provide the faculty administration office with the necessary details for them to award the document of proof regarding the student’s result. This result must be made available to the student within two working days after the result has been determined.
3. Contrary to the provisions in paragraph 2, the examiner shall determine the result of a written interim examination in the fourth quarter of the propedeutic phase within 5 working days of the date it was administered. Also contrary to the provisions in paragraph 2, there should be a period of at least 9 work days between the date of announcing the result of an interim examination in Osiris and the date of a resit of an interim examination from the fourth quarter of the core phase. This result must be made available to the student within one work day after the result has been determined.
4. In special cases, the Examination Board may extend the term in which the result must be determined as referred to in paragraph 2 by a maximum of 10 work days.
5. Contrary to the provisions in paragraphs 2 and 3, the faculty board may establish supplementary regulations for the components that are part of the first year (propedeuse) for the periods within which the results of interim examinations of those components must be determined, in particular with respect to the provisions in Section 5.
6. In instances in which an interim examination is administered in a form other than oral or written, the Examination Board shall determine prior to the administration of the examination how and when the student shall be issued a statement of the result. This term shall not be longer than 30 days after the interim examination was administered.
7. On this statement of the result of an interim examination, the student is informed of his/her right of inspection, referred to in Article 4.5, as well as the right to appeal to the Examination Appeals Board.
8. A student may submit an appeal of a decision by the Examination Board to the Examination Appeals Board within six weeks.

#### **Article 4.5 Right of inspection and right of cognisance**

1. Within at least 30 days following publication of a written interim examination result, the student may request access to review and inspect all graded work. For the results of interim examinations with “open” questions, at the student’s request he/she shall be granted a copy of their graded work at cost.

2. During the period referred to in paragraph 1 of this Article, any student who has taken an interim examination may review the questions and assignments of the interim examination in question, as well as the standards on which the result was based.
3. The Examination Board may determine that the inspection or review shall take place at a particular location and provide at least two different time periods. If the student demonstrates that he/she is unable to attend the inspection or review as a result of force majeure, then another option shall be offered, if possible within the period stated in paragraph 1 of this Article.
4. In all cases, provided this has been requested by the student in a timely fashion, the inspection must take place a minimum of five working days before the resit of an interim examination.
5. The Examination Board shall retain all written interim examinations and related papers (assignments or otherwise) that count towards the final result for a period of two years following the date when the examination was administered. Bachelor's programme reports and theses must remain available for visitations, accreditations, and inspections and shall be kept for seven years.

#### **Article 4.6 Confirmation of the result of the final examination**

1. The student is given the opportunity to take the final examination after he/she has provided sufficient proof that he/she has passed the components leading up to the final examination.
2. The Examination Board will determine the result of the final examination, as well as the rules in relation to the manner in which the result of the examination is determined.
3. Prior to determining the result of the final examination, the Examination Board may evaluate and assess the student's knowledge with respect to one or more components or aspects of the programme, if and to the degree that the results of the related interim examinations justify this.

#### **Article 4.7 Awarding distinctions**

1. With due observance of the provisions set out in this Article, the Examination Board is responsible for the decision of whether a distinction shall be awarded and if so, which distinction.
2. The distinctions
  - a. "Cum laude" shall be awarded if the weighted average result of the final assessment of the components referred to in paragraph 3 is equal to or higher than 8.0, or
  - b. "Summa cum laude" shall be awarded if the weighted average result of the final assessment of the components referred to in paragraph 3 is equal to or higher than 9.0.
3. The distinction shall be calculated on the basis of all components of the examination programme for which a mark has been awarded on a scale of 1 to 10, with the exception of extra-curricular components.
4. The number of EC of the component referred to in paragraph 3 shall serve as the weighting factor for the calculation of the weighted average result, unless provided otherwise in the programme-specific part of these regulations.
5. The distinction shall not be awarded if more than 10 per cent of the total study load of the examinations for the degree programme (being one or more components) has been re-sat or if interim examinations have been re-sat more than once, unless the Examination Board decides otherwise, stating the reasons for this decision.
6. If a student does not deregister on time, their non-participation in the exam will be seen as a used exam opportunity, unless the Examination Board decides otherwise. If a student can prove that

they were unable to participate or deregister on time due to a force majeure, the Examination Board can decide to retroactively deregister the student.

7. The distinction shall not be awarded if fraud was discovered in one of the examinations of the degree programme.

#### **Article 4.8      Fraud and plagiarism**

1. Supplement to Article 1.2 paragraph 1 sub-paragraph i, the faculty describes fraud as:
  - a. Fraud with midterms, labs, and exams, such as
    - i. having tools which are not allowed;
    - ii. cheating or exchanging information;
    - iii. pretending to be someone else, or having someone else represent as you during a midterm or exam;
    - iv. possession of the exam questions prior to the exam;
    - v. changing answers after the work has been handed in for assessment;
    - vi. providing incorrect information when requesting an exemption.
  - b. Fraud in theses and other written works, such as
    - i. plagiarism by using or copying other people's text, data, or ideas without correct or complete sourcing;
    - ii. plagiarism by using another student's work and presenting it as your own;
    - iii. fabricating or falsifying research data;
    - iv. handing in a thesis or other work created by someone else.
2. An attempt to commit fraud is also seen as fraud under this regulation.
3. The surveyor or examiner will immediately notify the student if they are being suspected of fraud.
4. The surveyor or examiner can order the student to make material available if they are being suspected of fraud. Refusal to do so is equated with fraud.
5. If suspicion arises during the exam, the student will be allowed to finish the exam.
6. The examiner makes a report on the suspicion of fraud and makes this report available to the student and the Examination Board.
7. The Examination Board will start an investigation. The student will be allowed to send in a written response to the report in paragraph 6. The Examination Board will hear both the examiner and the student.
8. The Examination Board will decide on the matter within 20 working days after receiving the report stated in paragraph 6. The Examination Board will notify the student and examiner with a written statement of their decision. The 20 working day period can be extended with ten days.
9. The Examination Board declares, if fraud has been established, the exam, thesis, or work in question to be invalid.
10. The Examination Board will not award an adjudication if fraud has been established.
11. The Examination Board clearly states the establishment of fraud and the penalties in the student's file.
12. The Examination Board can determine that a student is not allowed to participate in one or more exams for at most a year and only if fraud has been established.
13. The Examination Board can determine that a student is not allowed to hand in a thesis or written work for at most a year, if fraud has been established.

14. The Examination Board can suggest that the Executive Board terminates the student's enrolment in case of severe fraud.
15. In case of fraud, the Dean of the Honours Academy can determine, after a suggestion by the Examination Board, that the student can no longer participate in the university or faculty Honours Academy.

## Section 5. Study performance, support, advice and education evaluation

### Article 5.1 Study performance and support

1. The faculty dean is responsible for recording student results in such a way that, upon request, the Examination Board can respond by providing the student with an overview of the progress of the study within a reasonable timeframe.
2. The dean is responsible for providing adequate student counselling.

### Article 5.2 Binding study advice regulations

1. On behalf of the dean, the Committee on Binding Study Advice for First-Year Students (Commissie Studieadvies Eerste Jaar) will advise students on continuing their degree programme. This will occur at the end of the first year, but no later than 31 August, that the student has been registered for the propedeutic phase of the full-time Bachelor's degree programme as referred to in article 7.8b of the Act.
2. The propedeutic (foundation year) phase constitutes the curriculum of the first year of the Bachelor's programmes and consists of a study load of 60 EC.
3. The Committee on Binding Study Advice for First-Year Students shall issue a positive recommendation to students who have completed at least 39 EC of the first-year curriculum, as referred to in paragraph 2.
4. The Committee on Binding Study Advice for First-Year Students will advise students negatively on continuing their degree programme if a student does not meet the requirements referred to in paragraph 3, unless one or more of the personal circumstances as referred to in Article 5.4 of these regulations should play a role.
5. In case of a binding rejection, the Committee on Binding Study Advice for First-Year Students shall formulate a plan to inform the student of a binding negative study advice and provide the student with the opportunity to be heard before the binding study advice is issued.
6. In determining whether the required credits referred to in paragraph 3 have been achieved, exempted credits shall not be counted. Should more than 18 EC in exemptions have been granted, certain core programme components may be counted toward meeting the requirements referred to in paragraph 3.
7. The Committee on Binding Study Advice for First-Year Students will give binding advice on continuing their degree programme to students registered for a full-time programme after 31 January at the end of their second study year. The Committee on Binding Study Advice for First-Year Students will then advise students positively on continuing their degree programme if the propedeutic phase has been successfully concluded.



Students who switch degree programmes after 31 January within the Bachelor's programmes Chemistry, Molecular Life Sciences and Science, will receive the Binding Study Advice as referred to in paragraph 1 at the end of the first academic year.

8. The dean will be entitled to lay down additional rules for students who have registered for two degree programmes recognised as a dual degree programme under or pursuant to these Education and Examination Regulations.
9. Students who terminate their enrolment before 1 March will not receive binding study advice. If they re-enrol for the same programme in the following academic year, they shall receive the binding study advice at the end of the second year. The provisions of the second sentence of paragraph 7 shall apply accordingly.
10. A student may appeal the binding negative study advice with the Examination Appeals Board within six weeks. The appeal does not suspend the validity of the binding study advice.

### **Article 5.3 Preliminary recommendation**

1. In anticipation of the advice referred to in Article 5.2, the Committee on Binding Study Advice for First-Year Students will make preliminary recommendations at the end of the first semester (no later than 28 February) to students on continuing their degree programmes on the basis of their results to date.
2. The preliminary recommendation is especially meant as a warning for students who have failed to make adequate progress. The students in question will be invited for an interview with the student advisor to discuss how study results could be improved or what other alternative programmes would be better suited to them.

### **Article 5.4 Personal circumstances**

1. The Committee on Binding Study Advice for First-Year Students shall take into account personal circumstances in their binding study advice decision, as stated in Article 2.1 of the Act's Implementation Decree, insofar as these circumstances have been reported to the student advisor, a student dean, or another designated person, either by the student or by someone else on the student's behalf. The student may be asked to further substantiate or justify personal circumstance claims.
2. Only personal circumstances mentioned in or supported by the Act are eligible.

### **Article 5.5 Duration of the period of rejection**

1. Students who have received a binding negative study advice may not re-enrol in the relevant Bachelor's programme for a period of three years, or for any other Bachelor's programmes that the dean has determined fully or partially share the first-year phase. In any case, this concerns the Bachelor's programmes in Chemistry, Molecular Life Sciences, and Science.
2. In the event a student should register again for the degree programme after the period referred to in paragraph 1, this registration will be considered as a first registration under this paragraph and the relevant provisions will apply in full.

#### **Article 5.6      No binding negative advice or deferral of the decision**

1. On the basis of the circumstances referred to in Article 5.4 of these regulations, the dean, having heard the Committee on Binding Study Advice for First-Year Students may decide not to attach binding consequences to the negative advice to students on continuing the degree programme. Having heard the Committee on Binding Study Advice for First-Year Students, the dean may also decide, on the basis of the circumstances referred to, to not yet attach binding consequences to the negative advice.
2. If binding advice not to continue the degree programme is not given pursuant to paragraph 1, the Committee on Binding Study Advice for First-Year Students will give their binding advice as referred to in Article 5.2 before the end of the second study year if, at that time, the student has not yet obtained the 60 EC of the propedeutic year.

#### **Article 5.7      Method of education evaluation**

Considering the care for quality in the institution, as described in the Quality Education Handbook by Radboud University, the dean oversees that the quality of education is systemically evaluated.

## **PART III**                      **PROGRAMME-SPECIFIC PROVISIONS**

### **Section 6.     Access to the degree programme and education**

#### **Article 6.1        Replacement requirements for insufficient prior education**

1. Deficiencies in prior education as referred to in the general provisions of these EER are compensated through the successful completion, as deemed by the Examination Board, of still to be determined tests at the level of the pre-university education (VWO) final examination: English and Mathematics B.
2. The Examination Board will appoint one or more examiners charged with the task of administering the test(s) referred to in paragraph 1.

#### **Article 6.2        Colloquium doctum**

The admission assessment, referred to in Article 7.29 of the Act, is in relation to the following courses at the stated level: pre-university education (VWO) final examination level in English and Mathematics B.

#### **Article 6.3        Admission German students**

German students who included the Grundkurs or Leistungskurs Mathematik in their Abitur and passed these courses with a minimum of 7 (out of 15 points), will be admitted to the Bachelor's programme in Computing Science.

### **Section 7.     Structure and design**

#### **Article 7.1        Programme-specific learning outcomes**

In addition to the general learning outcomes described in the general provisions of these EER, the Chemistry degree programme aims to achieve the following learning outcomes:

1. System Development
  - describe and select methods for system development;
  - solve system development problems at a basic level.

You are able to think of a suitable application for a given situation and identify the necessary requirements for such a system, design the system and justify this design. You are also able to build it (together with others) and evaluate its functional correctness and usability. Finally, you are able to provide written documentation for the end product.
2. Research
  - recognize and select research methods (both generic as well as specific to the field of computing science);
  - solve research questions at a basic level.

In particular, this means that you are able to identify a relevant problem, and define and justify the appropriate research question in relation to this problem. You are able to select and describe a suitable theoretical framework, and justify the choice of this framework in relation to the problem to be solved. Finally, you are able to conduct the proposed research and report and present its results.

### 3. Communication

- present subject-specific information at a basic level in a clear manner to colleagues (both in oral and written form);
- document solutions.

In the case of collaboration with others, you are able to fulfil various roles, such as leading discussions, active and open listening and exchanging opinions with others.

### 4. Orientation and reflection

- for problems at basic level, indicate relevant areas in computing science and recognize their contributions, and
- specify characteristic functions, roles, activities and competences of computer scientists in the professional field.

You are able to reflect on your own role as a junior scientist, and participate in debates about the social implications of developments from our own field. In relation to your personal development, you are able to make a reasoned choice for a specific follow-up education or career start.

### 5. A bachelor's graduate can execute the above-mentioned actions in, and using the knowledge from, the following themes:

- a. Algorithms and theory
- b. Programming
- c. Computer Systems and Security
- d. Information and Knowledge Systems
- e. Mathematics
- f. Rights

### 6. For the Cyber Security specialisation track: a Bachelor's graduate can

- a. Analyse security problems and identify their causes. Describe and apply security-techniques, best practices, and principles. The above is not only limited to technical aspects; you are also able to analyse and judge personal and societal aspects concerning areas such as privacy, law, and implementations in organizations.

### 7. For the Software and Data Science specialisation track: a Bachelor's graduate can

- a. (Software Science) apply or create new platform-specific applications for 'devices'. You can define the meaning of (novel) programming language constructs and concepts, and you are able to analyse the behavior of programs by means of computational models and tools.
- b. (Data Science) distinguish techniques required for extracting relevant information from very large data collections. You know and can differentiate, select, and implement fundamental search methods.

### 8. For the Double Bachelor's programme in Mathematics and Computing Science:

- a. More in-depth mathematics and logics;
- b. For the specialisation Cyber Security: describe and apply techniques, cryptography for security.
- c. For the specialisation Software and Data Science:

- i. (Software Science) Define the meaning of (novel) programming language constructs and concepts, and analyse the behavior of programs by means of computational models and tools.
- ii. (Data Science) Know and differentiate fundamental search methods, and select and implement search algorithms.

## Article 7.2 Language of the programme

From the academic year 2018-2019 onward, the Bachelor's programme will be taught in English; the exams will be taken in English. As exceptions, the following post-propedeutic courses will be taught in Dutch in 2018-2019 (the number next to the course name indicates whether the course will still be taught in Dutch one last time or two last times):

- NWI-IBC035 Academisch Schrijven voor Informatici<sup>2</sup>
- NWI-IBC027 Algoritmen en Datastructuren<sup>1</sup>
- NWI-IBC003 Berekenbaarheid<sup>1</sup>
- NWI-IBC025 Berekeningsmodellen<sup>1</sup>
- NWI-IBC028 Complexiteit<sup>1</sup>
- NWI-I00036 ICT en Samenleving<sup>1</sup>
- NWI-IBC020 Informatiesystemen<sup>1</sup>
- NWI-IBC041 New Devices Lab<sup>1</sup>
- NWI-IBC019 Operating Systems<sup>1</sup>
- NWI-IBC039 Organizing Cyber Security<sup>2</sup>
- NWI-IBC042 Parallel Computing<sup>1</sup>
- NWI-IPC026 Semantiek en Correctheid<sup>1</sup>
- NWI-IBC037 Recht voor Informatici<sup>2</sup>
- NWI-IBI010 Reflectie en Beroepsoriëntatie<sup>2</sup>
- NWI-IBC026 Web Security<sup>1</sup>

## Article 7.3 Composition of the propedeutic phase

Subject to the general provisions of these EER, the degree programme comprises the following components:

### 1. Compulsory components (60 ec)

Course code	Course name	Ec
NWI-IBC017	Calculus and Probability Theory	3
NWI-IBC016	Combinatorics	3
NWI-IPC024	Databases	3

NWI-IPC025	Hacking in C	3
NWI-IPC031	Imperative Programming	6
NWI-IPC019	Information Modeling	3
SOW-BKI125	Introduction Artificial Intelligence for CS	3
NWI-IPC002	Languages and Automata	3
NWI-IPI004	Logic and Applications	6
NWI-IPC020	Mathematical Structures	3
NWI-IPC017	Matrix Calculation	3
NWI-IPI005	Object Oriented Programming	6
NWI-IPC006	Processors	3
NWI-IPC023	Requirements Engineering	3
NWI-IPC030	Research & Development: Project	3
NWI-IPC021	Security	6

#### Article 7.4 Composition of the core programme (post-propedeutic phase)

The post-propedeutic phase contains compulsory components worth 54 ec (see 1 below) and the choice between two specialisations of 24 ec each, namely *Cyber Security* and *Software and Data Science* (see 2 below). Besides that, it contains a minor space of 15 ec and an elective space of 12 ec (see 3 below). The student must also work on their portfolio during the post-propedeutic phase which is worth 3 ec (see 4 below). Lastly, there is a bachelor thesis worth 12 ec. The total of ec is 120.

##### 1. Compulsory components (54 ec)

Course code	Course name	Ec
NWI-IBC035	Academisch Schrijven voor Informatici	3
NWI-IBC027	Algoritmen en Datastructuren	6
NWI-IBC003	Berekenbaarheid	3
NWI-IBC028	Complexiteit	3
NWI-IBC040	Functional Programming	6
NWI-I00036	ICT en Samenleving	3
NWI-IBC020	Informatiesystemen	3
NWI-IBC037	Recht voor Informatici	3
NWI-IBC021	Networks and Distributed Systems	6
NWI-IBC019	Operating Systems	3
NWI-IBC042	Parallel Computing	3



NWI-IBI007	Research Methods	3
NWI-IBC026	Semantiek en Correctheid	3
NWI-IBI001	Software Engineering	6

## 2. Specialisation (24 ec)

Choose one of the specialisations below:

### a. Cyber Security

Course code	Course name	Ec
NWI-IBC023	Introduction to Cryptography	6
NWI-IBC022	Network Security	3
NWI-IBC034	Operating Systems Security	3
NWI-IBC039	Organizing Cyber Security	6
NWI-IBC038	Privacy and Identity	3
NWI-IPC026	Web Security	3

### b. Software and Data Science

Course code	Course name	Ec
NWI-IBC025	Berekeningsmodellen	3
NWI-IBC036	Big data	6
NWI-IBI008	Data Mining	6
NWI-IBC031	New Devices Lab	6
NWI-IBC024	Software Verification	3

## 3. Minor (15 ec)

## 4. Electives (12 ec)

Besides the requirement mentioned in article 3.3 paragraph 3, the elective must also meet the following demand:

1. Normally, an elective is part of a post-propedeutic phase of a programme at the Radboud University. If the chosen programme demonstrably does not show any common ground with computing science, it is also allowed that a course is chosen from the propedeutic phase of this particular programme.

## 5. Portfolio (3 ec)

The course NWI-IBI010: Reflection and Vocational Orientation fulfils the role of the portfolio in the Bachelor's programme in Computing Science.

## 6. Bachelor thesis (12 ec)

### Article 7.5 Minors that are not permitted

The programme does not have an educational minor. The minor Computing Science cannot be chosen as minor within the Bachelor's programme in Computing Science.

## Section 8. Transition provisions

### Article 8.1 Transition provisions cohort 2016-2017

Due to the transition to an English Bachelor's programme, a couple of courses have now switched to English while maintaining the same content, learning outcomes and course codes. These courses will count as the same course for students who started in 2016-2017. The English name will be mentioned below. Deviating courses will be in *Italics* (see article 8.1.3. for the transition provisions).

This is the programme for students who started the programme in the academic year 2016-2017:

#### 8.1.1. Propedeutic phase (60 ec)

Course code	Course name	Ec
NWI-IPI004	Beweren en Bewijzen (now Logic and Applications)	6
NWI-IPC024	Databases	3
NWI-IPC025	Hacking in C	3
<i>NWI-IPC014</i>	<i>Imperatief Programmeren 1 (now Imperative Programming)</i>	3
<i>NWI-IPC015</i>	<i>Imperatief Programmeren 2 (now Imperative Programming)</i>	3
<i>SOW-BKI121</i>	<i>Introductie AI A (now Introduction to AI for CS)</i>	4
NWI-IPC017	Matrixrekenen (now Matrix Calculation)	3
NWI-IPC019	Modelleren (now Information Modeling)	3
NWI-IPI005	Object Oriëntatie (now Object Oriented Programming)	6
NWI-IPC006	Processoren (now Processors)	3
<i>NWI-IPC029</i>	<i>Research &amp; Development: Project</i>	6
NWI-IPC021	Security	6
NWI-IPC002	Talen en Automaten (now Languages and Automata)	3
<i>NWI-IPC018</i>	<i>Wat is informatica?</i>	2

NWI-IPC026	Web Security	3
NWI-IPC020	Wiskundige Structuren (now Mathematical Structures)	3

### 8.1.2. Post-propedeutic phase

The post-propedeutic phase contains compulsory components worth 54 ec (see 1 below) and the choice between two specialisations of 24 ec each, namely *Cyber Security* and *Computing (now Software and Data Science)* (see 2 below). Besides that, it contains a minor space of 15 ec and an elective space of 12 ec (see 3 below). The student must also work on their portfolio during the post-propedeutic phase which is worth 3 ec (see 4 below). Lastly, there is a bachelor thesis worth 12 ec. The total of ec is 120.

#### 1. Compulsory components (54 ec)

Course code	Course name	Ec
NWI-IBC035	Academisch Schrijven voor informatici	3
NWI-IBC027	Algoritmen en Datastructuren	6
NWI-IBC003	Berekenbaarheid	3
NWI-IBC017	Calculus en Kansrekenen (now Calculus and Probability Theory)	3
NWI-IBC016	Combinatoriek (now Combinatorics)	3
NWI-IBC028	Complexiteit	3
NWI-IBC029	Functioneel Programmeren 1 (now Functional Programming)	3
NWI-I00036	ICT en Samenleving 1	3
NWI-IBC020	Informatiesystemen	3
NWI-IBC021	Netwerken en Gedistribueerde Systemen (now Networks and Distributed Systems)	6
NWI-IBI007	Onderzoeksmethoden (now Research Methods)	3
NWI-IBC019	Operating Systems	3
NWI-IPC023	Requirements Engineering	3
NWI-IBC026	Semantiek en Correctheid	3
NWI-IBI001	Software Engineering	6

#### 2. Specialisations (24 ec)

##### a. Cyber Security:

Course code	Course name	Ec
NWI-IBC023	Introduction to Cryptography	6

NWI-IBC037	Recht voor Informatici	3
NWI-IBC022	Network Security	3
NWI-IBC034	Operating Systems Security	3
NWI-IBC039	Organizing Cyber Security	6
NWI-IBC038	Privacy and Identity	3

*b. Computing:*

Course code	Course name	Ec
NWI-IBC025	Berekeningsmodellen	3
NWI-IBC036	Big data	6
NWI-IBI008	Data Mining	6
NWI-IBC030	<i>Functioneel Programmeren 2 (now Functional Programming)</i>	3
NWI-IBC031	<i>New Devices Lab</i>	3
NWI-IBC024	Software Verification	3

**3. Minor (15 ec)**

**4. Electives (12 ec)**

Besides the requirement mentioned in article 3.3 paragraph 3, the elective must also meet the following demand:

1. Normally, an elective is part of a post-propedeutic phase of a programme at the Radboud University. If the chosen programme demonstrably does not show any common ground with computing science, it is also allowed that a course is chosen from the propedeutic phase of this particular programme.

**5. Portfolio (3 ec)**

The course NWI-IBI010: Reflection and Vocational Orientation fulfils the role of the portfolio in the Bachelor's programme in Computing Science.

**6. Bachelor thesis (12 ec)**

**8.1.3. Deviating courses**

- *NWI-IPC018 Wat is informatica? (2 ec)* will not be taught from 2017-2018 onward. Instead, you are allowed to choose another component from the Computing Science programme that is not yet part of your programme.
- *NWI-IPC014 Imperatief Programmeren 1 (3ec)* will not be taught from 2017-2018 onward. Instead, you must, in consultation with your student advisor and the lecturer, complete the first half of the course NWI-IPC031 Imperative Programming (6 ec).

- *SOW-BKI121 Introduction AI A (4ec)* will not be taught from 2017-2018 onward. Instead, *SOW-BKI125 Introduction AI for CS (3ec)* must be chosen. Together with the student advisor the student must discuss the way in which the remaining 1 ec will be filled.
- *NWI-IPC015 Imperatief Programmeren 2 (3ec)* will not be taught from 2017-2018 onward. Instead, you must, in consultation with your student advisor and the lecturer, complete the second half of the course *NWI-IPC031 Imperative Programming (6 ec)*.
- *NWI-IPC029 Research & Development (6 ec)* will not be taught as a 6 ec course from 2017-2018 onward. Instead, you are allowed to choose *NWI-IPC030 Research & Development (3 ec)* in combination with another component from the Computing Science programme that is not yet part of your programme.
- *NWI-IBC029 Functioneel Programmeren 1 (3ec)* will not be taught from 2017-2018 onward. Instead, you must, in consultation with your student advisor and the lecturer, complete the first half of the course *NWI-IPC040 Functional Programming (6 ec)*.
- *NWI-IBC030 Functioneel Programmeren 2 (3ec)* will not be taught from 2017-2018 onward. Instead, you must, in consultation with your student advisor and the lecturer, complete the second half of the course *NWI-IPC040 Functional Programming (6 ec)*.
- *NWI-IBC031 New Devices Lab (3ec)* will not be taught from 2017-2018 onward. Instead, you must, in consultation with your student advisor and the lecturer, complete the first half of the course *NWI-IPC041 New Devices Lab (6 ec)*.

## Article 8.2 Transition provisions cohort 2017-2018

Due to the transition to an English Bachelor's programme, a couple of courses have now switched to English while maintaining the same content, learning outcomes and course codes. These courses will count as the same course for students who started in 2016-2017. The English name will be mentioned below. There are no further transition provisions.

This is the programme for students who started the programme in the academic year 2017-2018:

### 8.2.1. Propedeutic phase (60 ec)

Course code	Course name	Ec
NWI-IPI004	Assertion and Argumentation (now Logic and Applications)	6
NWI-IBC017	Calculus en Kansrekenen (now Calculus and Probability Theory)	3
NWI-IBC016	Combinatoriek (now Combinatorics)	3
NWI-IPC024	Databases	3
NWI-IPC031	Imperatief Programmeren (now Imperative Programming)	6
NWI-IPC025	Hacking in C	3
SOW-BKI125	Introduction to Artificial Intelligence for CS	3
NWI-IPC017	Matrixrekenen (now Matrix Calculation)	3
NWI-IPC019	Modelleren (now Information Modeling)	3
NWI-IPI005	Object Orientation (now Object Oriented Programming)	6

NWI-IPC006	Processoren (now Processors)	3
NWI-IPC023	Requirements Engineering	3
NWI-IPC030	Research & Development: Project	3
NWI-IPC021	Security	6
NWI-IPC002	Talen en Automaten (now Languages and Automata)	3
NWI-IPC020	Wiskundige Structuren (now Mathematical Structures)	3

### 8.2.2. Post-propedeutic phase

The post-propedeutic phase contains compulsory components worth 54 ec (see 1 below) and the choice between two specialisations of 24 ec each, namely *Cyber Security* and *Computing (now Software and Data Science)* (see 2 below). Besides that, it contains a minor space of 15 ec and an elective space of 12 ec (see 3 below). The student must also work on their portfolio during the post-propedeutic phase which is worth 3 ec (see 4 below) . Lastly, there is a bachelor thesis worth 12 ec. The total of ec is 120.

#### 1. Compulsory components (54 ec)

Course code	Course name	Ec
NWI-IBC035	Academisch Schrijven voor informatici	3
NWI-IBC027	Algoritmen en Datastructuren	6
NWI-IBC003	Berekenbaarheid	3
NWI-IBC028	Complexiteit	3
NWI-IBC040	Functional Programming	6
NWI-I00036	ICT en Samenleving	3
NWI-IBC020	Informatiesystemen	3
NWI-IBC037	Recht voor Informatici	3
NWI-IBC021	Networks and Distributed Systems	6
NWI-IBI007	Research Methods	3
NWI-IBC019	Operating Systems	3
NWI-IBC042	Parallel Computing	3
NWI-IBC026	Semantiek en Correctheid	3
NWI-IBI001	Software Engineering	6

#### 2. Specialisations (24 ec)

##### a. Cyber Security:



Course code	Course name	Ec
NWI-IBC023	Introduction to Cryptography	6
NWI-IBC022	Network Security	3
NWI-IBC034	Operating Systems Security	3
NWI-IBC039	Organizing Cyber Security	6
NWI-IBC038	Privacy and Identity	3
NWI-IPC026	Web Security	3

*b. Computing:*

Course code	Course name	Ec
NWI-IBC025	Berekeningsmodellen	3
NWI-IBC036	Big data	6
NWI-IBI008	Data Mining	6
NWI-IBC041	New Devices Lab	6
NWI-IBC024	Software Verification	3

**3. Minor (15 ec)**

**4. Electives (12 ec)**

Besides the requirement mentioned in article 3.3 paragraph 3, the elective must also meet the following demand:

1. Normally, an elective is part of a post-propedeutic phase of a programme at the Radboud University. If the chosen programme demonstrably does not show any common ground with computing science, it is also allowed that a course is chosen from the propedeutic phase of this particular programme.

**5. Portfolio (3 ec)**

The course NWI-IBI010: Reflection and Vocational Orientation fulfils the role of the portfolio in the Bachelor's programme in Computing Science.

**6. Bachelor thesis(12 ec)**

**8.2.3. Deviating courses**

There are no transition provisions for students who started in the academic year 2017-2018.

## **PART IV      FINAL PROVISIONS**

### **Section 9.    Final provisions**

#### **Article 9.1      Safety net scheme and hardship clause**

1. In any situations which are not fully or clearly covered by these regulations, the decision lies with the dean.
2. Any situations which these regulations may result in unreasonable hardship for individual students, the Examination Board or the dean is authorised to make an exception to the provisions in the Education and Examination Regulations.

#### **Article 9.2      Adoption and amendment**

1. Notwithstanding the provisions in Article 7 of the Structure Regulations, these regulations are drawn up or amended by the dean after receiving advice from the programme committees and after having obtained approval from the faculties' general assembly.
2. An amendment to these regulations cannot enter into force in the current academic year, unless the situation has the potential to make it extremely difficult for the student to participate in the programme.
3. In derogation from paragraph 1, the dean is authorised to drop elective components of the curriculum should the circumstances be deemed impossible to offer the course.

#### **Article 9.3      Entry into force**

These regulations shall enter into force on 1 September 2018.

#### **Article 9.4      Publication**

1. The dean is responsible for publishing these regulations and any amendments thereto.
2. Interested parties may consult these regulations through the prospectus.

As established by the dean on June 20, 2018.