



Universiteit Leiden

## **COURSE AND EXAMINATION REGULATIONS**

Valid from 1 September 2019

Master's programmes Biomedical Sciences.

These Course and Examination Regulations (henceforth OER) have been drawn up in accordance with the Higher Education and Research Act [*Wet op het hoger onderwijs en wetenschappelijk onderzoek; WHW*] (henceforth the Act) and the following Leiden University regulations:

- the Leiden Register of Study Programmes Framework Document;
- the Academic Calendar;
- the Regulations for Student Registration; Tuition Fees and Examination Fees
- the Regulations for Admission to Master's Programmes.

Pursuant to Article 7.14 of the Act, the Board of Directors of the LUMC regularly evaluates the OER and considers, for the purpose of monitoring and adjusting the study load, how much time it takes students to comply. In accordance with Article 9.18 of the Act, the Programme committee is assigned the task of annually assessing the implementation of the OER.

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## **Chapter 1      General Provisions**

### **Article 1.1      Scope of the regulations**

These regulations apply to the teaching and examinations of the Master's programme(s) Biomedical Sciences, henceforth referred to as the programme.

The programme is instituted in the Faculty of Medicine of Leiden University i.c. the Leiden University Medical Center (LUMC), hereinafter referred to as: the Faculty, and is taught as indicated in Appendix 1.

### **Article 1.2      Definitions**

In these regulations the following definitions apply:

- a. Board of Admissions:            the Board established by the Board of Directors of the LUMC that has the duty of determining, with the application of the entry requirements referred to in Article 7.30b, (1) and (3) of the Act and the University Regulations for Admission to Master's Programmes, which applicants can be admitted to this Master's programme;
- b. Board of Examiners:            the Board of Examiners for the programme, established and appointed by the Board of Directors of the LUMC in accordance with Article 7.12a of the Act;
- c. component:                      a unit of study in the programme, as defined in Article 7.3 of the Act. The study load of each component is expressed in whole credits. Each component is associated with an examination;
- d. credit:                              the unit in EC that expresses the study load of a component as referred to in the Act. According to the ECTS, one credit equals 28 hours of study;
- e. degree classification:            further degree classification by the Board of Examiners;
- f. ECTS:                                European Credit (Transfer System);
- g. e-Prospectus:                    the electronic prospectus containing specific and binding information about the programme. The e-Prospectus is included as an attachment to these regulations;
- h. examination:                      an inspection of the knowledge, understanding and skills of the student with respect to a particular component, and an assessment thereof (in accordance with Article 7.10 of the Act). An examination may consist of several constituent examinations. The inspection is conducted according to the method determined by the Board of the Examiners to assure the quality of examination and final examinations;

- i. examiner: the person appointed by the Board of Examiners to conduct examinations, in accordance with Article 7.12c of the Act;
- j. final examination: the examinations associated with the components belonging to the programme or the propaedeutic phase of the programme, including an investigation to be carried out by the Board of Examiners itself, as referred to in Article 7.10 of the Act;
- k. first/second reader the first or second examiner to read and assess the thesis/final paper/final report. The first reader/reviewer is also the supervisor;
- l. Leiden Register of Study Programmes register of the programmes offered by Leiden University, maintained under the supervision of the Executive Board, as referred to in Article 7 of the Executive and Management Regulations;
- m. level: the level of a component according to the abstract structure as defined in the Leiden Register of Study Programmes Framework Document<sup>1</sup>;
- n. nominal duration of study the study load in years of study as established in the Central Register of Higher Education Programmes;
- o. portfolio: a monitoring and assessment file with which students (1) demonstrate that they have achieved a sufficient level of academic education to be awarded the degree; (2) record their personal process of academic learning during the programme; and (3) receive appropriate supervision and study advice;
- p. practical: a practical assignment that contributes to an examination or final examination, as referred to in Article 7.13 (2) (d) of the Act, that takes one of the following forms:
- writing a thesis/final paper/final report,
  - writing a paper or creating an artistic work,
  - carrying out a research assignment,
  - participating in fieldwork or an excursion,
  - completing an internship, or
  - participating in another educational activity aimed at acquiring particular skills;
- q. programme: the programme to which the OER relates: a coherent set of components, aimed at achieving clearly defined objectives relating to the knowledge, understanding and skills that a graduate of the programme is expected to have acquired. Each programme is associated with a final examination;

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<sup>1</sup> [Leiden Register of Study Programmes Framework Document](#)

- r. student: a person enrolled at Leiden University in order to follow the courses, and/or sit the examinations and final examinations associated with the programme;
- s. Student Council Student participation council of the LUMC, as referred to in Article 9.37 of the Act.
- t. the Act: the Higher Education and Research Act [*Wet op het hoger onderwijs en wetenschappelijk onderzoek*; WHW];
- u. working day: Monday to Friday, excluding public holidays and the compulsory closure days specified by the Executive Board.

Definitions specific to the programme are laid out in Appendix 1.

The other definitions have the meaning that the Act ascribes them.

### Article 1.3 **Codes of conduct**

1.3.1 The Leiden University Code of Conduct on Standards of Behaviour between Lecturers and Students is applicable.<sup>2</sup> The aim of this code is to create a framework for a good, safe and stimulating work and study environment within Leiden University, in which teachers and students respect each other and in which mutual acceptance and trust are important values.

1.3.2. The Leiden University Regulations on ICT and Internet Use are also applicable.<sup>3</sup> These regulations define what is considered appropriate use of ICT and internet and how usage checks will be made. They also explain which conduct is not tolerated and the consequences that apply.

1.3.3 Furthermore, the following Faculty codes of conduct apply to the programme:

- Supplemental LUMC behaviour rules<sup>4</sup>

## Chapter 2 **Description of the Programme**

### Article 2.1 **Objectives of the programme**

The programme has the following objectives: all of which are laid out in Appendix 1.

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<sup>2</sup>[Leiden University Code of Conduct on Standards of Behaviour between Lecturers and Students](#)

<sup>3</sup>[Leiden University Regulations on ICT and Internet Use](#)

<sup>4</sup>[Supplemental LUMC behavioural rules](#)

Article 2.2     **Specialisations**

Specialisations of the programmes, if applicable, are laid out in Appendix 1.

Article 2.3     **Learning outcomes**

Graduates of the programme have attained the following learning outcomes, listed according to the Dublin descriptors: in Appendix 1.

Article 2.4 **Structure of the programme**

The programmes of the LUMC offer full-time tuition.

The nominal duration of the programme is as specified in Appendix 1.

Article 2.5     **Study load**

The programme has a study load as specified in Appendix 1.

Article 2.6     **Start of the programme; uniform structure of the academic year**

Starting dates of the programme are laid out in Appendix 1. In terms of regular courses, the programme is not based on the university semester system and comprises 42 teaching weeks. Programmes of the LUMC are an exception to the university semester system. The programme is flexible and is based on the schedule of the academic year, provided by the LUMC.

Article 2.7     **Final examinations of the programme**

The programme is associated with a master's final examination.

Article 2.8     **Language of instruction**

2.8.1 In accordance with the Code of Conduct on the Language of Instruction and Examination<sup>5</sup> the language(s) of instruction and examination in the programme is specified in Appendix 1. Students are expected to have an adequate command of the language(s) of instruction and examination in the programme, in accordance with the requirements stated in Article 5.2.3. As appropriate, the Faculty publishes OER in English for English-taught programmes.

2.8.2 Contrary to Article 2.8.1, in individual cases the Board of Examiners can permit the student to write the final thesis in another language, in accordance with the Guideline on Language Policy.<sup>6</sup>

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<sup>5</sup> [Code of Conduct on Language of Instruction](#)

<sup>6</sup> [Guideline on Language Policy](#)

## Article 2.9 **Quality**

The programme is accredited by NVAO<sup>7</sup> and meets the national and international quality requirements for degree programmes. The programme's teaching also meets the quality standards for teaching set out in the Leiden Register of Study Programmes Framework Document.

## Chapter 3 **Curriculum**

### Article 3.1 **Compulsory components**

3.1.1 The programme includes compulsory components worth a total study load as specified in Appendix 1. These compulsory components include the set components from which students are obliged to choose.

3.1.2 The e-Prospectus further specifies the actual structure of the programme, i.e. the study load, level,<sup>8</sup> contents and structure of the components on the curriculum. Changes to the e-Prospectus are submitted to the Programme Committee and the Student Council for approval of consultation (dependent on the right of approval- and consultation).

### Article 3.2 **Optional components**

3.2.1 Alongside the components referred to 3.1.1, the student selects components worth a total study load of as specified in Appendix 1.

3.2.2 The Board of Examiners must approve the student's selection of components.

3.2.3 In addition to the components taught at this university, and subject to the approval of the Board of Examiners, students may also select components offered by other Dutch or foreign universities, or components offered by another legal entity offering accredited undergraduate higher education programmes.

3.2.4 Students who are enrolled in the programme may assemble their own programme of components that are taught by an institution, as long as a final examination is associated with these. They will require the permission of the most appropriate Board of Examiners. When granting such permission, the Board of Examiners also indicates to which University programme the programme is considered to belong.<sup>9</sup> If necessary, the Board of Directors of the LUMC appoints a Board of Examiners to take this decision.

### Article 3.3 **Practicals**

3.3.1 For each component, the e-Prospectus specifies which practicals are included, the nature and scope of the student's workload for these practicals and whether participation in these is a condition

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<sup>7</sup> The Accreditation Organisation of the Netherlands and Flanders.

<sup>8</sup> In accordance with the 'abstract structure', as described in the Framework Document of the Leiden University Register of Study Programmes.

<sup>9</sup> In accordance with Article 7.3h of the WHW ('free curriculum in higher education').

of entry to (other parts of) the examination.. The Board of Examiners may exempt students from a practical, in which case the Board choose to apply alternative conditions.

3.3.2 The e-Prospectus specifies the scope and study load of the thesis/final paper/final report, including the requirements that the final assignment/thesis/final report must meet.

#### **Article 3.4 Sitting examinations and taking part in programme components**

3.4.1 Registrations for examinations and resits are automatic for students enrolled in a course.

3.4.2 Students are allocated to components in order of registration, on the provision that, provided they register in good time, students who are enrolled in a programme are guaranteed access to the components that are obligatory to the programme. Students may only take certain components once they have passed the examination of a preceding component. The e-Prospectus specifies the components to which this condition applies.

#### **Article 3.5 Distribution of study materials**

3.5.1 Students are not permitted to make audio or video recordings of lectures or have education-related meetings without the explicit prior permission of the relevant lecturer. Should such permission be granted, students are only legally permitted to use the recording for their own use; all forms of distribution or publication of the recordings are prohibited.

3.5.2 Students are prohibited from all forms of distribution or publication of study materials. The materials are for students' own use only.

### **Chapter 4 Examinations, Final Examination and Further Education**

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

4.1.1 Examinations are held twice during the academic year for each component offered in that year. The Board of Examiners determines the manner of resit for practicals.

4.1.2 If a component comprises a compulsory practical, students may only sit the examination as referred to in 4.1.1 if they have passed the practical, unless the Board of Examiners decides otherwise.

4.1.3 If the mark for a component results from several constituent examinations, it is possible to depart from the number of examinations and resits as referred to in 4.1.1, on the understanding that students are given the opportunity to resit and pass the component by taking an examination that is representative for the component. If applicable, this is specified in the e-Prospectus.

4.1.4 In accordance with Article 7.13 (2) (h) of the Act, the e-Prospectus specifies the dates of the examinations.

4.1.5 The Board of Examiners may set certain rules for taking the resit. These rules are specified in the Rules and Regulations of the Board of Examiners.

4.1.6 Contrary to the provisions of Article 4.1 and at a student's request, the Board of Examiners may in exceptional circumstances allow an additional resit.

4.1.7 If a student has passed an examination linked to a given component but nevertheless resits this examination without the permission of the Board of Examiners the result of the last sitting will not be assessed and as referred to in Article 4.1.5. In the case of a resit with the agreement of the Board of Examiners, the last obtained grade applies.

#### Article 4.2 **Obligatory sequence**

4.2.1 The e-Prospectus and the order specified in Appendix 1 specifies the sequence in which examinations must be taken. Students may only sit examinations that are subject to a compulsory sequence once they have passed the examinations for one or more other components.

4.2.2 For the components and their attendant examinations which must be completed in a given sequence, the Board of Examiners may in special cases, and following a substantiated written request by the student, agree to an alternative sequence.

#### Article 4.3 **Form of examination**

4.3.1 The e-Prospectus states whether an examination or constituent examination for a component will take the form of a written, oral or other test.

4.3.2 Students with a disability or chronic medical condition are given the opportunity to apply for individual examination arrangements adjusted to their particular disability or condition. These arrangements may not affect the quality or level of difficulty of the examination. If necessary, the Board of Examiners seeks expert advice, as referred to in the Protocol on Studying with a Disability,<sup>10</sup> before reaching a decision.

4.3.3 In special cases, the Board of Examiners may, at the request of the student and within the scope of the OER, permit a student to sit an examination in another manner than specified in the e-Prospectus.

4.3.4 Examinations are held in the language(s) of instruction for this programme that are specified in the OER. At the request of the student, the Board of Examiners may permit him or her to sit an examination in another language.

4.3.5 The final report is presented orally at the end of the internship in a seminar or in an alternative manner that is to be further specified in the e-Prospectus.

#### Article 4.4 **Oral examinations**

4.4.1 Students take oral examinations individually, unless the Board of Examiners decides otherwise.

4.4.2 Oral examinations are public, unless the Board of Examiners or the examiner concerned decides otherwise owing to special circumstances, or unless the student objects.

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<sup>10</sup> [Protocol on Studying with a Disability](#)

**Article 4.5 Rules and regulations set by the Board of Examiners**

4.5.1 In accordance with Article 7.12b (3) of the Act, the Board of Examiners establishes rules concerning the performance of its tasks and responsibilities and the measures it can take in the event of fraud.

4.5.2 The Board of Examiners must guarantee that students are entitled to appeal against decisions of the Board of Examiners or the examiners.

**Article 4.6 Assessment**

4.6.1 The examiner determines the mark immediately after an oral examination or constituent examination has been conducted. The student is informed of this through the University study progress system.

4.6.2 The examiner marks any written examination or other form of examination or constituent examination within 15 working days of the day on which the examination or constituent examination was taken, and informs the Educational office of the result by entering this into the University study progress system. The student is informed of this through the University study progress system. The student will be informed of the result at least five working days before the next resit of the examination. If this deadline is not met, the resit can be postponed.

4.6.3 If the examiner is unable to comply with the period of 15 working days specified in Article 4.6.2, the student is notified accordingly through Blackboard or Brightspace and in a personal e-mail to the student's u-mail address before this term expires. This notification includes the latest date by which the student will be informed of the result.

4.6.4 The examination result is expressed as a whole number or a number to a maximum of one decimal place up to and including 1.0 and 10.0. The result is not be expressed as a number between 5.0 and 6.0.

4.6.5 The result of the examination or constituent examination is considered to be a pass if the result is 6 or higher.

4.6.6 If students must complete a practical to be permitted to sit an examination, the Board of Examiners may decide that students have passed the examination once they have passed the practical.

4.6.7 Together with the written or electronic notification of examination results, students are also informed of their right to inspect their marked examination papers, as referred to in Article 4.8, as well as of the appeals procedure.

4.6.8 The Board of Examiners may draw up rules that specify under which conditions it may exercise its power as specified in Article 7.12b (3) of the Act to determine that students do not have to pass every examination and/or under which conditions the results of constituent examinations can compensate for each other. These rules are specified in the Rules and Regulations of the Board of Examiners.

**Article 4.7      Validity of examinations**

4.7.1      The Board of Directors of the LUMC may limit the validity of an examination pass, subject to the authority of the Board of Examiners to extend the period of validity in individual cases. The period of validity of an examination pass may only be limited if the examined knowledge, understanding or skills are demonstrably outdated.

4.7.2      The Board of Examiners may, in accordance with the criteria specified in the Rules and Regulations and at the request of the student, extend the validity of examinations for a period to be specified by the Board itself. In the event of special circumstances in the sense of article 7.51, second clause, of the law, the Board of Examiners will act in accordance with the pertinent provisions in article 7.10, fourth clause of the law.

4.7.3      The validity period referred to 4.7.1 starts on 1 September of the academic year following that in which the mark was obtained, or the exemption granted.

**Article 4.8      Inspection and feedback session**

4.8.1      Students are entitled to view their marked examination for a period of 30 days following the publication of the results of a written examination.

4.8.2      During the period referred to in 4.8.1, students may inspect the examination questions and assignments, as well as the marking schemes used to mark the examination.

4.8.3      The time and manner of the inspection and feedback session on the examination is specified in the e-Prospectus.

4.8.4      The Board of Examiners is authorised to decide whether the viewing of the examination paper and the feedback session are to be collective or individual.

4.8.5      The examiner determines where and when the viewing of the examination paper and the feedback session will take place.

4.8.6      Students who are unable to attend the feedback session due to demonstrable circumstances beyond their control are granted another opportunity, if possible within the period referred to in 4.8.1.

**Article 4.9      Exemption from examinations and/or practicals**

At the student's request and after consultation with the examiner in question, the Board of Examiners may grant the student exemption from one or more examinations or practicals if the student:

- has completed a component at a research university or university of applied sciences that is similar in content and level to the component for which the student is requesting exemption, or
- has demonstrated, through relevant work or professional experience, that he or she has acquired sufficient skills and knowledge in relation to the component in question.

**Article 4.10 Final examination**

4.10.1 The Board of Examiners awards a degree certificate when there is sufficient proof that the final examination has been passed.

4.10.2 As part of the final examination, the Board of Examiners is entitled to conduct its own evaluation of the knowledge, understanding and skills of the examination candidate and assess the results.

4.10.3 The degree is only conferred once the Executive Board has declared that all procedural requirements (including the requirement to pay tuition fees) have been met. One degree certificate is awarded for each programme. The degree certificate states that the programme or specialisation was delivered by Leiden University.

4.10.4 Pursuant to the regulations referred to in Article 7.11 (3) of the Act, a student who is entitled to graduate may ask the Board of Examiners to postpone graduation, as long as the student has not exceeded the maximum period of enrolment of the nominal duration plus one year for the programme in question.

4.10.5 This request must be submitted within five working days of the student receiving notification of his or her final examination results. In the request the student must indicate when he or she wishes to receive the degree certificate.

4.10.6 The Board of Examiners may also approve the request if refusing it would result in a considerable injustice.

4.10.7 A supplement in Dutch or in English that conforms to the standard European Diploma Supplement format, including the grading table applicable for the degree programme, is attached to the degree certificate. In addition to the degree certificate, students are issued with a translation of the degree certificate and a certificate in Latin.

**Article 4.11 The degree**

4.11.1 The degree of Master of Science is awarded to those who have passed the final examination of the programme.

4.11.2 The degree certificate specifies which degree has been awarded.

**Article 4.12 Degree classification**

4.12.1 The student is awarded a mark for the final examination.

4.12.2 The final mark is based on the weighted average of the marks obtained for all examinations that form part of the final examination, with the exception of the examinations for which an exemption was granted or examinations for which the student only obtained a proof of attendance. Components completed from other programmes, including components followed abroad, must be approved by the Board of Examiners.

4.12.3 The weighted average of all marks is determined by multiplying the number of ECTS credits for each component by the mark awarded for this component, adding these together and then dividing the result by the number of credits earned.

4.12.4 Without prejudice to the provisions of 4.12.6 and 4.12.7, the degree certificate and diploma supplement include the 'cum laude' classification if the following conditions are met for the full-time programmes:

- the weighted average for all components is 8.0 or higher;
- the mark for the Internships\* is 8.0 or higher;
- the examination was passed within the nominal duration of study + 1 year;
- Further conditions specific to the programme are laid out in Appendix 1.

The Board of Examiners sets corresponding conditions for part-time programmes, proportionate to the nominal duration of the study programme.

4.12.5 Without prejudice to the provisions of 4.12.6 and 4.12.7, the degree certificate and the diploma supplement include the 'summa cum laude' classification if the following conditions are met for the full-time programmes:

- the weighted average for all components is 9.0 or higher;
- the mark for the Internships\* is 9.0 or higher;
- the examination has been passed within the nominal duration of study;
- Further conditions specific to the programme are laid out in Appendix 1.

\*, Specified in Appendix 1

The Board of Examiners sets corresponding conditions for part-time programmes, proportionate to the nominal duration of the study programme.

4.12.6 The Board of Examiners may also decide to award a distinction in other, exceptional cases, on the condition that the weighted average mark does not differ by more than 0.5 from the marks stipulated in the fourth and fifth paragraphs above. This may involve such considerations as the student's development throughout his or her study programme, any exceptional performances on the part of the student in completing the final paper or thesis and any other relevant exceptional circumstances.

4.12.7 If a student has been subject to disciplinary measures as a result of irregularity, fraud or plagiarism, he or she is not awarded a distinction.

#### Article 4.13 **Further education**

The degree awarded grants the holder access to a PhD programme.

## **Chapter 5 Admission to the Programme**

### **Article 5.1 Confirmation of admission**

5.1.1 The Board of Directors of the LUMC provides confirmation of admission if the student meets the entry requirements specified in Articles 5.2 and 5.3, as long as the maximum number of students that the Executive Board has determined may be enrolled in the programme has not been exceeded. If admission is on the basis of Article 5.2.1, the proof of registration is also confirmation of admission. The latter only applies if the stated capacity is not exceeded as further specified in Appendix 1.

5.1.2 Confirmation of admission must be applied for according to the rules set out in the Regulations for Admission to Master's Programmes.<sup>11</sup>

### **Article 5.2 Admission to the programme**

5.2.1 Pursuant to Article 7.30b (1) of the Act holders of one of the following degrees may be admitted to the programme and one of its specialisations or who have successfully completed the following prescribed pre-master's programme: specified in Appendix 1.

5.2.2 The Board of Admissions may, on request, admit persons to the programmes who do not meet the requirements specified in 5.2.1 points a and b, but who can demonstrate to the satisfaction of the Board of Admissions that they possess the same level of knowledge, understanding and skills as holders of a degree specified 5.2.1, points a and b, possibly under further conditions, without prejudice to the conditions specified in 5.2.4.

#### **Article 5.2.3 Dutch and English languages<sup>12</sup>.**

5.2.3.1 As further clarification of Article 2.8 concerning command of the language of instruction, a student who wishes to be admitted to an English-taught master's programme must have one of the following diplomas or must meet the criteria of:

- An International Baccalaureate diploma (or other with English A);
- A diploma of secondary or higher education completed in the US, the United Kingdom, Ireland, New Zealand, Australia or Canada (with the exception of French-taught education in Canada);
- A diploma of an English-taught university degree programme completed at a Dutch research university;
- A pre-university education (VWO) diploma.
- A high school (or higher) diploma determined by SEA (Admissions Office) in an EER country, where English has been studied up to and including the final year of the programme, and

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<sup>11</sup>[Regulations for Admission to Master's Programmes](#)

<sup>12</sup> Letter of the Minister of Education, Culture and Science of 11 July 2018, decision on costs of standardised tests (costs of standardised tests, including language tests, are to be paid by the study programme from the academic year 2019-2020). This applies for all students. If possible, the Minister will make a decision on a different procedure for students with a diploma from outside the Netherlands.

where the level of English can be considered comparable to Dutch VWO (pre-university education).

The Language Advisor to the Board of Admissions may conduct an interview with the applicant by telephone to verify his/her level of English; The Board of Admissions may request that applicants demonstrate an adequate command at this level.

5.2.3.2 If a student who wishes to be admitted does not meet the requirements in 5.2.3.1, at least one of the following language requirements specified in Appendix 1 can be set.

5.2.3.3 As further clarification of Article 2.8 concerning command of the language of instruction, a student who is not a native Dutch speaker and who wishes to be admitted to a Dutch-taught master's programme must have passed *TUL-halfgevorderd* (equivalent to state examination NT2-II) or *TUL-gevorderd*.

5.2.3.4 If so wished, the language requirements specified in this article can be included as one of the qualitative admission requirements referred to in Article 5.2.4.

#### Article 5.2.4 **Qualitative admission requirements**

5.2.4.1 In addition to the requirements specified in 5.2.1 or 5.2.2, the following qualitative admission requirements specified in Appendix 1 apply for the programme pursuant to Article 7.30b (2) of the Act.

5.2.4.2 Where article 5.2.4.1 applies, the admission requirements will be implemented as follows: specified in Appendix 1.

5.2.4.3 Where article 5.2.4.1 applies, the deadline for the admission requirements is as follows: specified in Appendix 1.

#### Article 5.2.5 **Capacity limitation**

5.2.5.1 If the Executive Board has determined a maximum capacity for the programme, the order of admission will be determined by the qualitative admission requirements as referred to in Article 5.2.4.1.

5.2.5.2 Where article 5.2.5.1 applies, the method of selection on the grounds of the criteria will be as follows: specified in Appendix 1.

5.2.5.3 Where article 5.2.5.1 applies, the deadlines for selection are as follows: specified in Appendix 1.

5.2.5.4 Where article 5.2.5.1 applies, the weighting of the criteria will be as follows: specified in Appendix 1.

#### Article 5.3 **Deficiencies**

5.3.1 Holders of a bachelor's degree from a research university, a related university bachelor's diploma as referred to in 5.2.1, point b or an equivalent diploma with x (may vary from 1 to 15) ECTS

of deficiencies, may be admitted to the programme, as long as it may reasonably be expected that they will meet the entry requirements within a reasonable period of time.

5.3.2 Students who still have the deficiencies referred to in 5.3.1 when admitted to the programme may participate in the programme but may not sit any final examinations or examinations that the Board of Directors of the LUMC has specified in its decision to grant admission.

5.3.3 For the admission referred to in 5.3.1 the Board of Admissions assembles a catch-up programme with examination opportunities.

5.3.4 If students are admitted to the programme on the basis of 5.3.1 and must sit examinations to meet the entry requirements, these are not considered part of the curriculum of the Master's programme.

#### Article 5.4 **Bridging programmes** (Pre-master's)

5.4.1 If applicable for the programme, the bridging programmes (for the following target groups) in order to remove deficiencies are specified in Appendix 1.

5.4.2 Information on the bridging programmes can be requested from the study advisor of the programme.

### **Chapter 6 Student Counselling and Study Advice**

#### Article 6.1 **Student progress report**

6.1.1 The Directorate of Education LUMC keeps records of the results achieved by individual students.

6.1.2 Students may inspect their results in the student progress system at any time.

#### Article 6.2 **Introduction and student counselling**

The management of the programme is responsible for the introduction and student counselling.

#### Article 6.3 **Supervision of the thesis/final paper/final report**

6.3.1 The student draws up a plan for the thesis/the final paper/final report (internships) together with the first reader (supervisor). This plan is based on the study load for the internships, as specified in the e-Prospectus and as referred to in 3.3.2

6.3.2 The plan referred to in 6.3.1 also specifies the frequency and manner of supervision.

#### Article 6.4 **Professional sports**

Students who engage in sports at a professional level are given the opportunity to adjust their study programme to their sporting activities wherever possible. The management of the programme determines who falls within this category in line with the guidelines drawn up by the Executive Board.

#### Article 6.5 **Disability or chronic medical condition**

Where possible, students with a disability or chronic medical condition are given the opportunity to adjust their study programme to the limitations resulting from their disability or chronic medical condition. The programme can be adjusted to the individual disability or chronic medical condition of the student in question, but this must not affect the quality or level of difficulty of the components or the programme itself.<sup>13</sup>

#### Article 6.7 **Study and internships abroad**

Special measures will be taken for students who suffer from a demonstrable delay in their studies as a result of study or an internship abroad that has been approved by the Board of Examiners, in order to limit the delay.

### **Chapter 7 Evaluation of the Programme**

#### Article 7.1 **Evaluation of the programme**

The programme is evaluated as follows:

- Course and internship evaluations;
- programme evaluation, at the end of the programme.

The Programme Board/Programme Director will inform the Programme Committee about the outcomes of the evaluation.

### **Chapter 8 Final Provisions**

#### Article 8.1 **Amendments**

8.1.1 Amendments to these regulations are implemented by a separate order of the Board of Directors of the LUMC or the programme committee, depending on the topics concerned, with the prior consent of the Student Council and the departmental committee.

8.1.2 Amendments to these regulations which apply to a particular academic year must be implemented before the start of that year and published in the prescribed manner, unless earlier implementation of an amendment to the regulations is strictly necessary and in all reasonableness does not harm the students' interests.

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<sup>13</sup>[Protocol on studying with a disability](#)

8.1.3 Amendments to these regulations may not adversely affect any prior decision pertaining to students taken by the Board of Examiners on the basis of these regulations.

**Article 8.2 Publication**

The Board of Directors of the LUMC or the management of the programme is responsible for publishing these regulations, the rules and guidelines set by the Board of Examiners, and any amendment to these articles via the University website.

**Article 8.3 Term of application**

The OER apply for the duration of one academic year.

**Article 8.4 Entry into force**

These regulations enter into force on 1 September 2019.

**Appendix 1: Master's Degree Programmes  
MSc Biomedical Sciences**

**Ad. Chapter 1 General Provisions**

**Ad. Article 1.1 Scope of the regulations**

The programme is taught in Leiden at the LUMC.

**Ad. Article 1.2 Definitions**

Internship "Junior research project-I (JRP-I)" and "Junior research project-II (JRP-II)". The Master's Internship Committee is responsible for the procedures of all master internships and the Scientific Review.

**Ad. Chapter 2 Description of the Programme**

**Ad. Article 2.1 Objectives of the programme**

The programme had the following objectives:

- to impart to students' academic knowledge, insight, skills, and methodology in the field of biomedical sciences;
- to encourage students to adopt an academic attitude by acquiring the ability to:
  - engage in individual and independent academic thinking;
  - analyse complex issues;
  - write academic reports;
  - apply specialist knowledge and skills in a philosophical and social context;
- to prepare students for an academic career and postgraduate education, or to prepare them for a career in teaching or another career outside academia.

**Ad. Article 2.2 Specialisations**

The programme has the following specialisations:

- Research;
- Management;
- Communication;
- Education;
- Health.

**Specialisation and diversity**

A. "The Master's programme of each student must cover a diverse spectrum of research methods. In order to accomplish this required diversity, the combination of the student's Junior Research Projects I and II, and FOS courses should cover the areas of research methodology listed in the Procedure for Training Periods Biomedical Sciences 2019-2020."

B. Students are furthermore encouraged to cover a diverse spectrum of research disciplines and diseases. However, students with specific interest in and strong motivation towards specialization in

e.g. Data-driven research, Neurosciences, Immunity, Infectious disease and Tolerance, Cancer Pathogenesis and Therapy (see appendices IV till VII), or other disciplines are allowed to do so, provided they cover the diverse spectrum of research methods stated under A.

*Ad. Article 2.3 Learning outcomes*

**General learning outcomes (applicable to all specialisations), in accordance with the Dublin descriptors.**

The holder of a Master's Degree in Biomedical Sciences:

*Knowledge and Understanding*

- K1 knows and understands (state-of-the-art) the development, structure, growth and integrated functioning of the healthy human body;
- K2 knows and understands (in-depth and current) the main developmental disorders and diseases of the human body, as well as the endogenous and exogenous factors that play a part in the development of such disorders and diseases;
- K3 knows and understands subject-specific aspects in various combinations of the following fields: molecular and cellular biology, genetics, immunology, anatomy, pathology, physiology, microbiology, neurobiology, endocrinology, -omics and/or data science;
- K4 knows and understands the most common and recent analytical techniques in biochemistry, molecular biology, cellular biology, immunology and/or imaging, as well as different research methodologies in epidemiology and/or statistics;
- K5 knows and understands the social aspects of the biomedical field, such as medical and scientific ethics, as well as legislation and rules related to conducting his/her own research;
- K6 knows and understands the measures for promoting and protecting general health, as well as measures for avoiding or reducing complications and/or recurrence of diseases.

*Applying Knowledge and Understanding*

- AK1 is able to apply most common and recent analytical, quantitative and statistical techniques in biomedical science;
- AK2 is able to develop a scientifically sound research plan and protocol and to evaluate this plan against the opinion of others;
- AK3 is able to critically analyse and consider experimental results and data from his/her own research, to process this data and to construct databases of relevant specialist literature;
- AK4 is able to think in multidisciplinary terms and to make connections between his/her own research and (international) research results.

*Making Judgements*

- J1 is able to estimate the value and applicability of laboratory and clinical results obtained within the context of his/her own research;
- J2 is able to relate research within the field of Biomedical Sciences to relevant associated fields (such as Medicine, Biology, Pharmacology);
- J3 is able to systematically collect, select and interpret biomedical data from scientific literature for his/her own research;
- J4 shows responsible scientific conduct through his/her capacity to form a balanced judgement based on consideration of relevant social, cultural, scientific or ethical aspects.

*Communication*

- C1 is able to communicate scientific data, conclusions from his/her own research, as well as the knowledge, motives and considerations underlying this research clearly and unambiguously to a specialist and non-specialist public;
- C2 is able to defend and debate his/her own position regarding his/her own research;
- C3 is able to participate in organisation and management of multidisciplinary (project)teams, both in the private and public sector;
- C4 is able to translate questions from the public debate into a scientific research question and to formulate research projects based on this.

*Learning Skills*

- L1 is able to acquire and extend knowledge and understanding efficiently, which includes study of specialist literature;
- L2 is able to reflect on his/her own actions as well as on the actions and judgements of others, and to assimilate these to improve his/her own product or approach;
- L3 is able to adopt a professional and critical position during (research) projects and is able to give and receive peer review;
- L4 is able to think and work at an academic level and is able and willing to improve on this;
- L5 is able and aware of the necessity to keep abreast of relevant developments in the biomedical field;
- L6 is able to make a conscious choice in favour of a possible further specialist training or a position in the job market.

**Additional learning outcomes: Research**

*Knowledge and Understanding*

- R-K7 is able to deepen and extend learning outcomes K1 - K6 by performing a second research internship;
- R-K8 knows and understands interdisciplinary aspects regarding laboratory animal science.

*Applying Knowledge and Understanding*

- R-AK5 is able to work independently on his/her research in order to show overall control in his/her research and to assess where his/her own research can contribute to the biomedical sciences field and to society;
- R-AK6 is able to formulate scientific questions/objectives in such a way that useful experiments can be designed of which the results will not only extend knowledge but preferably also contribute to problem solving that is relevant to the biomedical sciences field and to society.

*Making Judgements*

- R-J5 is able to systematically collect, select and interpret biomedical data from scientific literature in order to write a scientific review.

*Learning Skills*

- R-L7 is able to acquire and extend knowledge and understanding independently and efficiently for the purpose of his/her own research.

**Additional learning outcomes: Management**

*Knowledge and Understanding*

- M-K7 knows and understands (at a basic level) the structure of businesses and organisations in the health care as well as the biomedical sector;
- M-K8 knows and understands the basics of strategic and marketing management, financial management, project management, organisational sciences, patent policy and quality management.

*Applying Knowledge and Understanding*

- M-AK5 is able to plan and execute organisational research within a business, relevant to a biomedical research domain;
- M-AK6 is able to work independently on his/her project in order to show overall control in his/her project and to assess where his/her own project can contribute to the field.

*Making Judgements*

- M-J5 is able to call attention to, characterise and describe problems in projects and organisations, and to develop policies to address and resolve these problems.

*Learning Skills*

- R-L7 is able to acquire and extend knowledge and understanding independently and efficiently for the purpose of his/her own project.

**Additional learning outcomes: Communication**

*Knowledge and Understanding*

- C-K7 knows and understands aspects of modern information and communication technology;
- C-K8 knows and understands aspects of human learning processes.

*Applying knowledge and understanding*

- C-AK5 is able to work independently on his/her project in order to show overall control in his/her project and to assess where his/her own project can contribute to the field.

*Communication*

- C-C5 is able to apply different methods of communicating knowledge;
- C-C6 is able to place developments in (biomedical) science within a social perspective and to make these developments understandable for a wider audience;
- C-C7 is able to interest a wider audience in such developments, and to motivate this audience to participate in a social debate on such developments;
- C-C8 is able to communicate research results comprehensibly to non-specialists, and to advise judiciously on the implications of such research results.

*Learning Skills*

- C-L7 is able to acquire and extend knowledge and understanding independently and efficiently for the purpose of his/her own project.

**Additional learning outcomes: Education**

*Knowledge and Understanding*

- E-K7 knows and understands human learning processes.

*Applying Knowledge and Understanding*

- E-AK5 is able to familiarise students with the most important features and contents of the field, as well as the position of the field within society;
- E-AK6 is able to help students form contacts with other fields, including as a means of supporting them in their choice of education and occupation;
- E-AK7 is able to develop and evaluate an educational product on workability and relevance.

*Making Judgements*

- E-J6 has a vision of biology as a school subject and of its place in society, as well as in relation to other natural sciences.

*Communication*

- E-C5 is able to apply different methods of communicating knowledge.

*Learning Skills*

- E-L7 is able to acquire and extend knowledge and understanding independently and efficiently for the purpose of his/her own project and/or teaching.

For more information on the learning outcomes for the purpose of a function in secondary education see: 'Learning outcomes/ Initial Competence Requirements ICLON Teacher Education' (Eindtermen/ Startbekwaamheidseisen ICLON Lerarenopleiding) and the 'Decision on Competence Requirements for Teaching Staff' (Besluit Bekwaamheidseisen Onderwijspersoneel) (<http://wetten.overheid.nl/BWBR0018692/> under Title 4: Competence Requirements havo and vwo upper school, in Dutch).

**Additional learning outcomes: Health**

*Knowledge and Understanding*

- H-K7 is able to deepen and extend learning outcomes K1 - K6 by performing a second research internship;
- H-K8 has a broad overview of the medical sciences.

*Applying Knowledge and Understanding*

- H-AK5 is able to critically analyse medical data and to integrate this data in his/her own research;
- H-AK6 is able to work independently on his/her research in order to show overall control in his/her research and to assess where his/her own research can contribute to the biomedical sciences field and to society.

*Communication*

- H-C5 is able to mediate between the life sciences and medical science by working in both disciplines.

*Learning Skills*

- H-L7 is able to acquire and extend knowledge and understanding independently and efficiently for the purpose of his/her own research.

**Ad. Article 2.4 Structure of the programme**

The nominal duration of the master programme Biomedical Sciences is two years.

**Ad. Article 2.5 Study load**

The programme has a study load of 120 ECTS credits.

**Ad. Article 2.6 Start of the programme**

The programme starts on 1 September and on 1 February of each year.

**Ad. Article 2.8 Language of instruction**

In accordance with the Code of Conduct on the Language of Instruction and Examination<sup>14</sup> the language of instruction and examination in the programme is English in the programme for the Research, Management and Communication specialisations and English and Dutch for the specialisations Education and Health. Students are expected to have an adequate command of the language(s) of instruction and examination in the programme, in accordance with the requirements stated in Article 5.2.3. As appropriate, the Faculty publishes OER in English for English-taught programmes.

**Ad. Chapter 3 Curriculum**

**Ad. Article 3.1 Compulsory components**

The programme includes compulsory components worth a total study load of 94 (Research); 81 (Health); 83 (Management); 88 (Communication); 99 (Education) ECTS credits. These compulsory components include the set components from which students are obliged to choose.

**Ad. Article 3.2 Optional components**

Alongside the components referred to 3.1.1, the student selects components worth a total study load of 26 EC for the Research specialisation; 39 EC for the Health specialisation; 37 EC for the Management specialisation; 32 EC for the Communication specialisation and 21 EC for the Education specialisation.

**Ad. Chapter 4 Examinations, Final Examination and Further Education**

**Ad. Article 4.12 Degree classification**

The degree certificate and the diploma supplement include the 'cum laude' classification if the following additional condition is met:

-all programme components of the master programme were passed at the first attempt with a mark higher than 7.2.

The degree certificate and the diploma supplement include the 'summa cum laude' classification if the following additional condition is met:

-all programme components of the master programme were passed at the first attempt with a mark higher than 8.2.

Internships is defined as "Junior research project-I (JRP-I)" and "Junior research project-II (JRP-II)".

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<sup>14</sup> [Code of Conduct on Language of Instruction](#)

## **Ad. Chapter 5 Access and Admission to the Programme**

### **Ad. Article 5.1 Confirmation of admission**

The maximum number of students that can be enrolled in the first year of the programme of the master Biomedical Sciences at the LUMC is 100 students.

### **Ad. Article 5.2 Admission to the programme**

*Ad. Article 5.2.1* Pursuant to Article 7.30b (1) of the Act holders of one of the following degrees may be admitted to the programme and one of its specialisations or who have successfully completed the following prescribed pre-master's programme:

- a bachelor's degree in Biomedical Sciences [bachelor Biomedische Wetenschappen], of a NVAO accredited Biomedical Sciences programme, at the level of a Dutch or Flemish University;
- a prescribed pre-master's programme pursuant to article 5.4.1.

#### *Ad. Article 5.2.3.1*

- For the Education specialisation, which requires additional knowledge of Dutch (see article 2.8), this means vwo-6 Dutch, or: a TUL Advanced Leiden University examination for the regular teachers training programme, or a TUL Intermediate Leiden University examination for the bilingual World Teachers Training Programme (WTTP), or equivalent qualifications in the Dutch language. The Board of Admissions may request that applicants demonstrate an adequate command at this level. If required, language requirements can be included as one of the qualitative admission requirements referred to in Article 5.2.4

*Ad. Article 5.2.3.2* If a student who wishes to be admitted does not meet the requirements in 5.2.3.1, at least one of the following language requirements can be set:

- IELTS, each test component must score a minimum of 6.5;
- TOEFL, each test component must score a minimum of 23 (internet-based);
- C1 level within CEF (Common European Framework of Reference for Languages).

#### *Ad. Article 5.2.4*            **Qualitative admission requirements**

*Ad. Article 5.2.4.1* In addition to the requirements specified in 5.2.2, the following qualitative admission requirements apply for the programme pursuant to Article 7.30b (2) of the Act:

- The (bachelor) degree was passed within the nominal duration of the study plus one year at the start of the master's programme;
- Research experience for at least three months in a final project (internship) at the start of the master's programme. During this project (internship) the applicant has acquired skills with respect to working in a laboratory for at least three weeks;

- In depth knowledge, understanding and skills (demonstrated by grades and/or ECTS) in Immunology (6 ECTS), Pathology (6 ECTS), Bio-Statistics (6 ECTS), Neuroscience (6 ECTS) and Molecular Biology (9 ECTS) at the start of the master's programme;
- Grade Point Average of at least 6.4 (Dutch grading system; or international equivalent) at the submission deadline and 6.5 (Dutch grading system; or international equivalent) at the start of the master's programme;
- Mark of at least 7.0 (Dutch grading system; or international equivalent) for the (bachelor) internship at the start of the master's programme;

*Ad. Article 5.2.4.2* Where article 5.2.4.1 applies, the admission requirements will be implemented as follows:

- Date when the (bachelor) degree was obtained;
- Nominal duration of the (bachelor) degree;
- Experience in performing research at a laboratory (internship);
- In depth knowledge, understanding and skills in Immunology, Pathology, Bio-Statistics, Neuroscience and Molecular Biology;
- Grade Point Average (GPA; the GPA is the weighted average of the Bachelor's course grades according to the international Grading system (maximum 4.00));
- Mark for the (bachelor) internship;

*Ad. Article 5.2.4.3* Where article 5.2.4.1 applies, the deadline for the admission requirements is as follows:

Submission of all the required application documents on the first of April for a start in September. Submission of all the required application documents on the first of November for a start in February, provided that the capacity of 100 is not exceeded.

*Ad. Article 5.2.5* **Capacity limitation**

*Ad. Article 5.2.5.2* Where article 5.2.5.1 applies, the method of selection on the grounds of the criteria will be pursuant to article 5.2.4.2 and 5.2.5.4.

*Ad. Article 5.2.5.3* Where article 5.2.5.1 applies, the deadlines for selection are as follows:

A selection procedure shall be held if the number of applicants exceeds the maximum capacity. Applicants will be informed about such a measure within eight weeks after the submission deadline.

Applicants will be informed whether or not they are provisionally admitted into the programme within ten weeks after the submission deadline.

*Ad. Article 5.2.5.4* Where article 5.2.5.1 applies, the weighting of the criteria will be as follows:

- Period between the date that the (bachelor) degree was obtained and the start of the Biomedical Science master's programme; range 1-5
  - The degree was passed within the nominal duration of the study plus one year; range 1-5;
  - Research experience for at least three months in a final project (internship). During this project (internship) the applicant has acquired skills with respect to working in a laboratory; range 1-5;
  - In depth knowledge, understanding and skills (demonstrated by grades and/or ECTS) in Immunology (6 ECTS), Pathology (6 ECTS), Bio-Statistics (6 ECTS), Neuroscience (6 ECTS) and Molecular Biology (9 ECTS); range 1-10;
  - Grade Point Average of at least 6.4 (Dutch grading system; or international equivalent); range 1-7;
- 
- Each applicant will be assigned a random number.
  - All scores will be summed and each applicant will receive a ranking number.
  - Applicants who have successfully completed a pre-master programme (premaster applicants) will receive the lowest ranking (e.g. rank number 1, 2, etc.);
  - For the other applicants, the applicant with the highest score will receive the lowest available ranking (e.g. rank number 10, 11, etc.);
  - When applicants have an equal score, the pre-assigned random number determines the ranking order of the applicants (lowest pre-assigned number will obtain the lowest available rank number);
  - The applicants ranked in the range 1-100 are conditionally admitted to the programme, provided that they accept the offer within two weeks. If the offer is not accepted within two weeks, we will consider it to be rejected. The position will then be offered to the applicant with the next ranking number.

*Ad. Article 5.4* **Bridging programmes** (Pre-master's)

*Ad. Article 5.4 .1.* The programme in Biomedical Sciences has developed the following bridging programmes (for the following target groups) in order to remove deficiencies:

- Students from the Hogere Laboratorium School with a Dutch bachelor's degree in Biology and Medical Laboratory Research, including a research internship in an academic institution; Entrance to the pre-master programme is limited to a maximum of 10 Dutch Hogere Laboratorium School students;
- Medical students (LUMC); Journey into Biomedical Sciences (BW-track).

## Contents of the programme

Students within all specialisations are required to earn a minimum of 60 European Credits (ECTS) from courses pertaining to Biomedical Sciences.

The components of the **Research** specialisation are:

code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
312100510Y	Career orientation***	2	no	400
312200400Y	Course on Laboratory Animal Science	4	yes	400
312100300Y	How to Write a Research Proposal	2	yes	400
312200100Y	Research Proposal Biomedical Sciences	5	no	600
312200200Y	JRP-II Research Internship	40	yes	600
312200300Y	Scientific Review Biomedical Sciences	6	yes	600
312100400Y	Reflection Course: Scientific Conduct	1	no	400
3125FOS-variable-Y	Choice of: Frontiers of Science	12	yes	500
	Elective area	14		≥ 400

The components of the **Management** specialisation are:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
312100510Y	Career orientation***	2	no	400
4603STRA5Y	Strategy*	5	yes	400
4603SBBM3Y	Marketing (SBB)*	3	yes	400
4603SBBF3Y	Financial management*	3	yes	400
4603SBBT4Y	Technology and operations management*	4	yes	400
312300100Y	Project Proposal Management internship	3	yes	600
312300200Y	JRP-II Management Internship**	26-42	yes	600
312100300Y	How to Write a Research Proposal	2	no	400
312100400Y	Reflection Course: Scientific Conduct	1	no	400
3125FOS-variable-Y	Choice of: Frontiers of Science	12	yes	500
	Elective area	9-25		≥ 400

\* Students with prior education in management, business and entrepreneurship (e.g. students who have completed the Science Based Business (SBB) Fundamentals course – Bachelor edition) are exempted from following the courses Strategy, Marketing (SBB) and Financial management in the master's Management specialisation. These courses need to be substituted by at least an equal number of ECTS credits of other SBB master modules, offered by the Faculty of Science, or elsewhere. Technology and Operations Management still has to be followed.

Students that have finished Science Based Business (SBB) Fundamentals (MSc edition) are exempted from following courses in the master's Management specialisation: Strategy, Marketing (SBB), Financial management, Technology and operations management.

\*\* During the JRP-II management internship it is compulsory to attend 3 Management discussion sessions at the LUMC.

\*\*\* Compulsory for students, starting from September 2018; For students, that have started in 2016-17 or 2017-18, 312100500Y Career orientation 1 ECTS suffices; students who have started prior to September 2016 have to take either Career orientation (1 ECTS or 2 ECTS) or Guest Lectures.

The components of the **Communication** specialisation are:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
312100300Y	How to Write a Research Proposal	2	no	400
312100400Y	Reflection Course: Scientific Conduct	1	no	400
312100510Y	Career orientation***	2	no	400
4603SCF19Y	Science, Communication and Society (SCS)-Fundamentals*	19	yes	400
4383SNAV4Y	Scientific Narration and Visualization*	4	yes	400
4603SCSPPY	SCS Project Proposal	3	yes	600
variable	JRP-II SCS Internship	23-34	yes	600
3125FOS-variable-Y	Choice of: Frontiers of Science	12	yes	500
	Elective area	9-20		≥ 400

\* Students that have finished 4603SCSFMY Science, Communication and Society (SCS)-Fundamentals (17 ECTS) are exempted from following the new courses: Science, Communication and Society (SCS)-Fundamentals (19 ECTS) and Scientific Narration and visualization (4 ECTS).

The components of the **Education** specialisation are:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
312100510Y	Career orientation***	2	no	400
variable	ICLON Ierarenopleiding Biologie	60	yes	600
312100300Y	How to Write a Research Proposal	2	no	400
312100400Y	Reflection Course: Scientific Conduct	1	no	400
3125FOS-variable-Y	choice of: Frontiers of Science	12	yes	500
	Elective area	9		≥ 400

The compulsory components of the **Health** specialisation are:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
312100300Y	How to Write a Research Proposal	2	no	400
312100510Y	Career orientation***	2	no	400
312400100Y	JRP-II Research internship*	20-40*	yes	600
312400200Y	Semi-arts stage (16 wkn)**	22**	yes	600
312100400Y	Reflection Course: Scientific Conduct	1	no	400

3125FOS-variable-Y	choice of: Frontiers of Science	12	yes	500
	Elective area	7-27*		≥ 400

\*The Examination Board decides on the minimum length of Junior Research Project-II depending on previous education of the student. This means that for students with a Dutch or Flemish, NVAO accredited bachelor Biomedical Sciences, JRP-II can be flexible in length. For students who have successfully completed the premaster Journey into Biomedical Sciences (BW-track; bachelor Medicine Leiden), JRP-II is at least 28 wks long (40 ECTS).

\*\* The entry requirement for the “Semi-arts stage”, minimal length 16 weeks, consists of the successful completion of all compulsory clinical rotations (co-schappen) belonging to the master’s Dutch or Flemish, NVAO accredited, programme in Medicine. Depending on the Leiden Medical curriculum, Leiden medical students will obtain either 20 ECTS, curriculum 2007+ or 22 ECTS curriculum 2012 for their “Semi-arts stage”.

\*\*\* Compulsory for students, starting from September 2018; For students, that have started in 2016-17 or 2017-18, 312100500Y Career orientation 1 ECTS suffices; students who have started prior to September 2016 have to take either Career orientation (1 ECTS or 2 ECTS) or Guest Lectures.

### Specialisation and diversity

A. “The Master’s programme of each student must cover a diverse spectrum of research methods. In order to accomplish this required diversity, the combination of the student’s Junior Research Projects I and II, and FOS courses should cover the areas of research methodology listed in the Procedure for Training Periods Biomedical Sciences 2019-2020.”

B. Students are furthermore encouraged to cover a diverse spectrum of research disciplines and diseases. However, students with specific interest in and strong motivation towards specialization in e.g. Data-driven research, Neurosciences, Immunity, Infectious disease and Tolerance, Cancer Pathogenesis and Therapy (see appendices IV till VII), or other disciplines are allowed to do so, provided they cover the diverse spectrum of research methods stated under A.

**Appendix: Frontiers of Science courses**

The scope for Frontiers of Science (FOS) courses involves opting for components listed below.

Code	Course component	ECTS	Level
3125FOS01Y	Regulation of the Immune Response in Human Disease	6	500
3125FOS02Y	Allogeneic Transplantation and Immunotherapy: From Bench to Bedside	6	500
3125FOS03Y	Genome (In)Stability, Cancer and Ageing	6	500
3125FOS30Y	Molecular Data Science: from disease mechanisms to personalized medicine***	6	500
3125FOS05Y	Pathogen Host Interactions	6	500
3125FOS06Y	Electrical Interactions in the Heart: From Disease to Treatment	4	500
3125FOS07Y	Depression and other Stress Related Disorders	6	500
3125FOS08Y	Research Applications of Developmental Biology	4	500
3125FOS09Y	From Genetic Disease to Functional Genomics* <sup>1</sup>	6	500
3125FOS10Y	Molecular Virology of RNA Viruses	6	500
3125FOS27Y	Cardiometabolic Disease <sup>+</sup> , * <sup>2</sup>	6	500
3125FOS12Y	The Pathophysiology of Coagulation	6	500
3125FOS13Y	Chemical Biology, Signal Transduction and Targeted Therapy	6	500
3125FOS14Y	Clinical Pharmacology	4	500
3125FOS15Y	Stem Cells	6	500
3125FOS16Y	Proteomics in Biomedical Research	6	500
3125FOS17Y	Biomedical Translational Research in Surgery	6	500
3125FOS18Y	Advances in Neurophysiology	6	500
3125FOS19Y	Translational Neurogenetics* <sup>1</sup>	6	500
3125FOS28Y	Biological Mechanisms of Ageing and Development	6	500
3125FOS21Y	Imaging in Neurosciences	6	500
3125FOS22Y	Cutting edge Immunology: from Chemistry to Metabolism* <sup>2</sup>	6	500
3125FOS23Y	Finding new causes of thrombosis: the clinical-epidemiologic approach. From idea to publication	6	500
3125FOS25Y	Clinical and Functional Neuroanatomy	6	500
3125FOS29Y	Glycobiology in Health & Disease	4	500

The following components count as FOS course, but are organized outside the LUMC. Specific selection criteria may exist.

Code	Course component	ECTS	level
3125FOS50Y	Tumor Immunology, Virology and Cancer† University of Heidelberg, German Cancer Research Center	5	500
3125FOS51Y	Pathogenic Microorganisms† University of Heidelberg, German Cancer Research Center	5	500
3125FOS56Y	Molecules, neurons, networks and behavior † University of Heidelberg, Interdisciplinary Center for Neurosciences	5	500
3125FOS52Y	Biolab internship Tumor immunology, Virology and Cancer†# University of Heidelberg, German Cancer Research Center	10-15	500
3125FOS53Y	Biolab internship Pathogenic Microorganisms†# University of Heidelberg, German Cancer Research Center	10-15	500
3125FOS58Y	Biolab internship Neuroscience†# University of Heidelberg, Interdisciplinary Center for Neurosciences	10-15	500
3125FOS54Y	Frontiers in Translational Medicine at Karolinska Institute	22	500
3125FOS55Y	Bioinformatics at Karolinska Institute***	5	500

# the number of ECTS is agreed upon prior to the start of the Biolab internship by the master Biomedical Sciences and the student. A 6 week Biolab will give 10 ECTS and a 9 week Biolab will give 15 ECTS.

† In addition to a FOS Course and/or Biolab internship in Heidelberg, students always have to follow at least 1 FOS course in Leiden. The additional ECTS obtained in Heidelberg will go to the elective area.

\*<sup>1</sup> Only one of these Genetic FOS courses may be followed.

\*<sup>2</sup> Only one of these FOS courses may be followed.

\*\*\* Only one of these Bioinformatics FOS courses may be followed.

+ Students that have passed the minor “Heart and Blood Vessels” are not eligible to enter this course.

## Appendix: Electives

The scope of Electives (art. 3.2.3) also involves components listed below.

code	course component	ECTS	level
3126ELE03Y	Philosophical Inquiry concerning Biomedicine A	1	400
3126ELE04Y	Philosophical Inquiry concerning Biomedicine B	1	400
3126ELE05Y	Fact or fiction: the human factor	1	400
3126ELE12Y	Regression-analysis	1	400
3126ELE06Y	How to Start (my master)**	1	400
3126ELE07Y	CRiP-advanced concepts in epidemiology	1	400
3126ELE08Y	CRiP-Using R for data analysis	1	400
3126ELE13Y	Survival-analysis	1	400
3126ELE14Y	Masterclass klinisch onderzoek en epidemiologie (in Dutch)	3	400
3126ELE15Y	Journal club: dagelijkse toepassingen van de epidemiologie (in Dutch)	3	400
3126ELE16Y	Statistical aspects of clinical trials	1	400
3126ELE17Y	Dwalingen in de methodologie (in Dutch)	2	400
3126ELE18Y	Repeated measures	1	400
3126ELE19Y	Genetical epidemiology	1	400
3126ELE20Y	Statistics and Probability	9	400
3126ELE21Y	Meta-analysis	1	400
3126ELE09Y	Guest lectures (15 lectures)*+	1	400
3126ELE10Y	Guest lectures (30 lectures)* +	2	400
3126ELE11Y	CIS: Presenting like a Pro	1	400
3126ELE11Y	CIS: Film-making for scientists	1	400

\* Can be taken only once in the master curriculum for students starting from September 2016.

\*\* Compulsory for students without a bachelor degree in Medicine or Biomedical Sciences in Leiden.

+ For students from September 2018 onwards, only 2126ELE10Y Guest lectures (1 ECTS) is eligible.

The following components count as elective course but are organized outside the LUMC.

5794KCA09	Art & Life Sciences	5	500
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3126ELE50Y	Netherlands Cancer Institute: Experimental Oncology*	6	400
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\*Experimental Oncology, elective since Sept. 2016, before Sept. 2016 this was a FOS-course.

### Appendix V – Specialisation Research – Track in Data-driven research

A specified track in Data-driven research can be followed within the master’s Research specialization. The programme consists of:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
3125FOS-variable-Y	choice of: Frontiers of Science	12	yes	500
312100510Y	Career orientation	2	no	400
312200400Y	Course on Laboratory Animal Science	4	yes	400
312100300Y	How to Write a Research Proposal	2	no	400
312200100Y	Research Proposal Biomedical Sciences	5	yes	600
312200200Y	JRP-II Research Internship	40	yes	600
312200300Y	Scientific Review Biomedical Sciences	6	yes	600
312100400Y	Reflection Course: Scientific Conduct	1	no	400
	Elective area in Data-driven research (see below)	14		≥ 400

1. JRP-II, Research Proposal, and Scientific Review must be dedicated entirely to a subject related to Data-driven research;
2. Students should take at least 65 ECTS and at the most 71 ECTS (of a total of 120 ECTS) in Data-driven research subjects (including JRP-II, Research Proposal and Scientific Review). Data-driven research ECTS may be accumulated by choosing from Data-driven research related Frontiers of Science courses and elective courses listed in the table below, or Data-driven research related courses outside the LUMC and Leiden University;
3. JRP-I has to be conducted in a laboratory, in line with the rules and guidelines of the master in Biomedical Sciences (see Appendix II, section: specialization and diversity).

*List of modules that can be used to accumulate at least 65 ECTS in Data-driven research:*

Code	Course component	ECTS	level
3125FOS23Y	FOS: Finding new causes of thrombosis: the clinical-epidemiologic approach. From idea to publication	6	500
3125FOS04Y	FOS: Molecular Data Science: from disease mechanisms to personalized medicine	6	500
3125FOSxxY	FOS: Biological Mechanisms of Ageing and Development	6	500
3126ELE07Y	Elective: CRiP-advanced concepts in epidemiology	1	400
3126ELE08Y	Elective: CRiP-Using R for data analysis	1	400
3126ELE12Y	Elective: Regression-analysis	1	400
3126ELE13Y	Elective: Survival-analysis	1	400
3126ELE21Y	Elective: Meta-analysis	1	400
3126ELE18Y	Elective: Repeated measures	1	400
3126ELE19Y	Elective: Genetical epidemiology	1	400
3126ELE16Y	Elective: Statistical aspects of clinical trials	1	400
3126ELE20Y	Elective: Statistics and Probability	9	400
3126ELE14Y	Elective: Masterclass klinisch onderzoek en epidemiologie (in Dutch)	3	400
3126ELE15Y	Elective: Journal club: dagelijkse toepassingen van de epidemiologie (in Dutch)	3	400
3126ELE17Y	Elective: Dwalingen in de methodologie (in Dutch)	2	400

**Appendix – Specialisation Research – Track in Neurosciences**

A specified track in Neurosciences can be followed within the master's Research specialization.  
The programme consists of:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
3125FOS-variable-Y	choice of: Frontiers of Science	12	yes	500
312100510Y	Career orientation	2	no	400
312200400Y	Course on Laboratory Animal Science	4	yes	400
312100300Y	How to Write a Research Proposal	2	no	400
312200100Y	Research Proposal Biomedical Sciences	5	yes	600
312200200Y	JRP-II Research Internship	40	yes	600
312200300Y	Scientific Review Biomedical Sciences	6	yes	600
312100400Y	Reflection Course: Scientific Conduct	1	no	400
	Elective area in Neurosciences (see below)	14		≥ 400

1. JRP-II, Research Proposal, and Scientific Review must be dedicated entirely to a neurosciences subject;
2. Students should take at least 65 ECTS and at the most 71 ECTS (of a total of 120 ECTS) in neurosciences subjects (including JRP-II, Research Proposal and Scientific Review). Neurosciences ECTS may be accumulated by choosing from neuroscience Frontiers of Science courses and neurosciences elective courses listed in the table below, or neurosciences master courses outside LUMC and Leiden University;
3. JRP-I may also be conducted in the broad neurosciences domain, provided that JRP-I and JRP-II are using research techniques and methodologies that are sufficiently different, in line with the rules and guidelines of the master in Biomedical Sciences (see Appendix II, section: specialization and diversity), and only after approval of the Board of Examiners. In that case, the maximum of 71 ECTS mentioned above may be surpassed.

*List of modules that can be used to accumulate at least 65 EC in Neurosciences.*

Code	course component	ECTS	practical	level
3125FOS25Y	FOS-Clinical and Functional Neuroanatomy	6	Yes	500
3125FOS18Y	FOS-Advances in Neurophysiology	6	Yes	500
3125FOS07Y	FOS-Depression and other Stress Related Disorders	6	No	500
3125FOS21Y	FOS: Imaging in Neurosciences	6	Yes	500
3125FOS19Y	FOS-Translational Neurogenetics	6	Yes	500
3120015PPY	Neuroscience (LCTN) seminars	2	No	500

**Appendix – Specialisation Research – Track in Immunity, Infectious Disease and Tolerance**

A specified track in Immunity, Infectious Disease and Tolerance can be followed within the master's Research specialization. The programme consists of:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
3125FOS-variable-Y	choice of: Frontiers of Science	12	yes	500
312100500Y	Career orientation	2	no	400
312200400Y	Course on Laboratory Animal Science	4	yes	400
312100300Y	How to Write a Research Proposal	2	no	400
312200100Y	Research Proposal Biomedical Sciences	5	yes	600
312200200Y	JRP-II Research Internship	40	yes	600
312200300Y	Scientific Review Biomedical Sciences	6	yes	600
312100400Y	Reflection Course: Scientific Conduct	1	no	400
	Elective area in Immunity, Infectious Disease and Tolerance (see below)	14		≥ 400

1. JRP-II, Research Proposal, and Scientific Review must be dedicated entirely to an Immunity, Infectious Disease and Tolerance subject;
2. Students should take at least 65 ECTS and at the most 71 ECTS (of a total of 120 ECTS) in Immunity, Infectious Disease and Tolerance subjects (including JRP-II, Research Proposal and Review). Immunity, Infectious Disease and Tolerance ECTS may be accumulated by choosing from Immunity, Infectious Disease and Tolerance Frontiers of Science courses and Immunity, Infectious Disease and Tolerance elective courses listed in the table below, or Immunity, Infectious Disease and Tolerance master courses outside LUMC and Leiden University;
3. JRP-I may also be conducted in the broad Immunity, Infectious Disease and Tolerance domain, provided that JRP-I and JRP-II are using research techniques and methodologies that are sufficiently different, in line with the rules and guidelines of the master in Biomedical Sciences (see Appendix II, section: specialization and diversity), and only after approval of the Board of Examiners. In that case, the maximum of 71 ECTS mentioned above may be surpassed.

*List of modules that can be used to accumulate at least 65 ECTS in Immunity, Infectious Disease and Tolerance.*

Code	course component	ECTS	practical	level
3125FOS22Y	FOS: Cutting edge Immunology: from Chemistry to Metabolism	6	yes	500
3125FOS01Y	FOS: Regulation of the Immune Response in Human Disease	6	yes	500
3125FOS02Y	FOS: Allogeneic Transplantation and Immunotherapy: From Bench to Bedside	6	yes	500
3125FOS05Y	FOS: Pathogen Host Interactions	6	yes	500
3125FOS15Y	FOS: Stem Cells	6	yes	500
3125FOS10Y	FOS: Molecular Virology of RNA Viruses	6	yes	500
3125FOS04Y	FOS: Molecular Data Science: from disease mechanisms to personalized medicine	6*	yes	500
3125FOS09Y	FOS: From Genetic Disease to Functional Genomics	6*	yes	500
3125FOS13Y	FOS: Chemical biology, Signal Transduction and Targeted Therapy	6*	yes	500
3125FOS16Y	FOS: Proteomics in Biomedical Research	6*	yes	500

\* A maximum of one of these courses may count for accumulating Immunity, Infectious Disease and Tolerance ECTS.

## Appendix – Specialisation Research – Track in Cancer Pathogenesis and Therapy

A specified track in Cancer Pathogenesis and Therapy can be followed within the master's Research specialization. The programme consists of:

Code	course component	ECTS	practical	level
312100100Y	Clinical Research in Practice	5	yes	400
312100200Y	Junior Research Project-I	29	yes	500
3125FOS-variable-Y	choice of: Frontiers of Science	12	yes	500
312100510Y	Career orientation	2	no	400
312200400Y	Course on Laboratory Animal Science	4	yes	400
312100300Y	How to Write a Research Proposal	2	no	400
312200100Y	Research Proposal Biomedical Sciences	5	yes	600
312200200Y	JRP-II Research Internship	40	yes	600
312200300Y	Scientific Review Biomedical Sciences	6	yes	600
312100400Y	Reflection Course: Scientific Conduct	1	no	400
	Elective area in Cancer Pathogenesis and Therapy (see below)	14		≥ 400

1. JRP-II, Research Proposal, and Scientific Review must be dedicated
2. entirely to an Cancer Pathogenesis and Therapy subject;
3. Students should take at least 65 ECTS and at the most 71 ECTS (of a total of 120 ECTS) in Cancer Pathogenesis and Therapy subjects (including JRP-II, Research Proposal and Review). Cancer Pathogenesis and Therapy ECTS may be accumulated by choosing from Cancer Pathogenesis and Therapy Frontiers of Science courses and Cancer Pathogenesis and Therapy elective courses listed in the table below, or Cancer Pathogenesis and Therapy master related courses outside LUMC and Leiden University;
4. Junior Research Project-I (JRP-I) may also be conducted in the Cancer Pathogenesis and Therapy domain, provided that JRP-I and JRP-II are using research techniques and methodologies that are sufficiently different, in line with the rules and guidelines of the master in Biomedical Sciences (see Appendix II, section: specialization and diversity), and only after approval of the Board of Examiners. In that case, the maximum of 71 ECTS mentioned above may be surpassed.

*List of modules that can be used to accumulate at least 65 ECTS in Cancer Pathogenesis and Therapy.*

Code	course component	ECTS	practical	level
3125FOS13Y	FOS: Chemical Biology, Signal Transduction and Targeted Therapy	6**	yes	500
3125FOS02Y	FOS: Allogeneic Transplantation and Immunotherapy: From Bench to Bedside	6	yes	500
3125FOS03Y	FOS: Genome Instability, Cancer and Ageing	6	yes	500
3125FOS15Y	FOS: Stem Cells	6	yes	500
3125FOS04Y	FOS: Molecular Data Science: from disease mechanisms to personalized medicine	6**	yes	500
3125FOS16Y	FOS: Proteomics in Biomedical Research	6**	yes	500
3126ELE50Y	Elective: Netherlands Cancer Institute: Experimental Oncology#*	6	yes	500
3125FOS05Y	FOS: Pathogen Host Interactions#	6#	yes	500
3125FOS10Y	FOS: Molecular Virology of RNA Viruses	6#	yes	500
3125FOS53Y	FOS: Courses and Biolab internships University of Heidelberg, German Cancer Research Center#	5-20**	yes	500
3125FOS54Y	Frontiers in Translational Medicine at Karolinska Institute#	22**	yes	500
3125FOS55Y	FOS Bioinformatics at Karolinska Institute#	5**	yes	500

\*\* See Appendix III for more information.

# Only one of these courses may count for Cancer Pathogenesis and Therapy ECTS.

\* Experimental Oncology, elective since Sept. 2016, before Sept. 2016 this was a FOS-course.

**Appendix– Premaster’s programme Biomedical Sciences- Health  
(ex Art. 5.5)**

The compulsory components of the premasters’ programme (Journey into Biomedical Sciences) which prepares selected Leiden Medical bachelors for a masters’ programme in Biomedical Sciences (with specialisation Health) are:

code	course component	ECTS	Practical	Level
3113425PPY	Premaster Cellular Communication	3	Yes	200
3113431PPY	Premaster Medical Genetics	3	No	200-300
3113435PPY	Premaster Immunology	3	No	300
3113441PPY	Premaster Molecular Biology and Oncology	4	No	300-400
3113446PPY	Premaster Communication in Science	1	No	300
3113450PPY	Premaster Review	4	Yes	300
3113455PPY	Premaster Immunology Laboratory Skills	4	Yes	300
M2910,M2920, M3720, M3730 or OM040	Moleculair onderzoek in het laboratorium (Elective in Medicine)	4	Yes	200-300
M2910,M2920, M3720, M3730	Choice of Electives in Medicine	4	Variable	200-300

or according to the new programme offered from 2013-14 onwards:

code	course component	ECTS	Practical	Level
3113426PPY	BW-track Cellular Communication	4	Yes	200
3113432PPY	BW-track Medical Genetics	4	No	200-300
3113436PPY	BW-track Immunology	4	No	300
3113442PPY	BW-track Molecular Biology and Oncology	5	No	300-400
3113447PPY	BW-track Communication in Science	1	No	300
3113451PPY	BW-track Review	4	Yes	300
	LUMC-onderzoeksminor	15	Yes	300-400