UNIVERSITY OF AMSTERDAM

FACULTY OF SCIENCE

TEACHING AND EXAMINATION REGULATIONS
PART B

Academic year 2019-2020
MASTER'S PROGRAMME BIOMEDICAL SCIENCES

Contents

Chapter 1. General Provisions

Article B-1.1 – Definitions

In addition to part A, the following definitions are used in part B

a.	Course	Education imparted in a series of lectures or meetings
b.	Literature Review	A component of 12 EC comprising literature resulting in a written report
c.	Personal Education Plan	An individual study plan for the student's Master's programme.
d.	Research Project	Compulsory internship/master thesis of 30-60 EC always resulting in a written report and oral presentation

Article B-1.2 – General information master's programme

1. The Master's programme Biomedical Sciences (CROHO 66990) is offered on a full-time basis and the language of instruction is English.
2. The programme has a workload of 120 EC.
3. The programme consists of the cluster Medical Biology and the cluster Neurobiology in which the following tracks are offered:
   Medical Biology cluster:
   - Cell Biology and Advanced Microscopy (CBAM);
   - Developmental and Therapeutic Biology
   - Experimental Internal Medicine (EIM);
   - Infection and Immunity (I&I);
   - Medical Biochemistry and Biotechnology (MBB);
   - Oncology (ONC).

   Neurobiology cluster:
   - Physiology of Synapses and Networks (PSN);
   - Cognitive Neurobiology and Clinical Neurophysiology (CN2);
   - Molecular Neurosciences (MNS);
   - Psychopharmacology and Pathophysiology (PPP).

Article B-1.3 – Intake dates

The programme is offered starting in the first semester of the academic year only (1 September). The intake date mentioned in this paragraph ensures a programme that can be expected to be completed within the time set for the programme.

Chapter 2. Programme objectives and exit qualifications

Article B-2.1 – Programme objective

The programme aims at:

- teaching students to conduct empirical research to develop their skills, knowledge and insights into Biomedical Sciences;
- providing a student-oriented education that is of high, internationally recognised quality;
- offering students the opportunity to gain knowledge and insight in an international setting;
- stimulating cooperation in the development of science, based on knowledge in Biomedical Sciences;
- providing a feasible study programme to a heterogeneously composed student population in an inspiring academic learning environment;
- educating students to become research-skilled professionals, that can deal with current scientific knowledge and apply this knowledge independently in new and continuously changing practical situations.

Article B-2.2 – Exit qualifications

1. The graduate of the Master's programme Biomedical Sciences has *[between brackets the most associated Dublin descriptor(s)]*:
   - the ability to read up on and master current scientific research developments and have knowledge of current scientific developments within relevant biomedical research *[Knowledge and understanding]*;
   - the analysing, problem-solving and synthesising abilities in order to deal with current scientific knowledge in medical biology and/or neurobiology and apply this knowledge in new and continuously changing practical situations, also in broader, multidisciplinary contexts *[Applying knowledge and understanding]*;
   - both a broad basic medical biological and/or neurobiological as well as specialist knowledge of one or more sub-areas of biomedical sciences, as basis or opportunity for originality in developing and/or applying ideas *[Knowledge and understanding]*;
   - the ability to formulate questions on the frontline of scientific research *[Knowledge and understanding, Applying knowledge and understanding, Making judgements]*;
   - the ability to formulate realistic and falsifiable (research) hypothesis, based on incomplete, limited or complex information and translate this into a research proposal *[Knowledge and understanding, Applying of knowledge and understanding, Making judgements]*;
   - the ability to independently set up and conduct biomedical experiments and laboratory measurements contributing to a line of research *[Applying of knowledge and understanding, Learning skills]*;
   - the skills to present research plans and results, orally or written, in English, at various scales and levels of abstraction, and communicate these to specialist and non-specialist audiences *[Communication]*;
   - the skills to analyse and interpret biological patterns and processes in both a qualitative and quantitative sense *[Applying of knowledge and understanding]*;
   - the ability to get acquainted with a field of study in a short period of time by self-study, to form one's own opinion and to write a critical essay in a set period of time *[Making judgements]*;
   - the ability to integrate the many hierarchical levels present in medical biology and/or neurobiology, and understands the interactions between biomedical sciences and other sciences *[Making judgements]*;
   - the ability to fulfil a position in society requiring an academic qualification as an independently operating professional that has a good knowledge base and attitude towards a biomedical approach to relevant societal issues *[Learning skills]*;
   - an attitude that enables critical reflection *[Making judgements, Learning skills]*.
2. In addition to paragraph 1, the student finishing the track Cell Biology and Advanced Microscopy has obtained the following track-specific qualifications:
   - the ability to interpret and evaluate current state-of-the-art research in the fields of cell biology and microscopy and to start an independent research project in this direction;
   - Has the know-how and research experience to act as a self-directed professional in an environment in which understanding of cell biological processes and visualise these processes through microscopy is required.
3. In addition to paragraph 1, the student finishing the track Developmental and Therapeutic Biology has obtained the following track-specific qualifications:
   - the ability to interpret and evaluate current state-of-the-art research in the field of developmental and therapeutic biology and to start an independent research project in this direction;
   - Has the know-how and research experience to act as a self-directed professional in an environment in which understanding of developmental biology is required.
4. In addition to paragraph 1, the student finishing the track Experimental Internal Medicine has obtained the following track-specific qualifications:

- the ability to interpret and evaluate current state-of-the-art research in the field of experimental internal medicine and to start an independent research project in this direction;
- Has the know-how and research experience to act as a self-directed professional in an environment in which understanding of human organ physiology is required.

5. In addition to paragraph 1, the student finishing the track Infection and Immunity has obtained the following track-specific qualifications:
   - the ability to interpret and evaluate current state-of-the-art research in the fields of infection and immunity and to start an independent research project in this direction;
   - Has the know-how and research experience to act as a self-directed professional in an environment in which understanding of infectious and immunological processes is required.
6. In addition to paragraph 1, the student finishing track Medical Biochemistry and Biotechnology has obtained the following track-specific qualifications:
   - the ability to interpret and evaluate current state-of-the-art research in the fields of biochemistry and biotechnology and to start an independent research project in this direction;
   - Has the know-how and research experience to act as a self-directed professional in an environment in which understanding of biochemical processes is required.
7. In addition to paragraph 1, the student finishing the track Oncology has obtained the following track-specific qualifications:
   - the ability to interpret and evaluate current state-of-the-art research in the field of oncology and to start an independent research project in this direction;
   - Has the know-how and research experience to act as a self-directed professional in an environment in which understanding of oncological processes is required.
8. In addition to paragraph 1, the student finishing the track Physiology of Synapses and Networks has obtained the following track-specific qualifications:
   - a solid knowledge of the basic disciplines that together form Neuroscience with a focus at the cellular and network level: cellular neurophysiology, synaptic communication, synaptic plasticity and anatomy;
   - solid understanding of memory formation and the cellular and network aspects that are corrupted in Alzheimer's Disease.
9. In addition to paragraph 1, the student finishing the track Cognitive Neurobiology and Clinical Neurophysiology has obtained the following track-specific qualifications:
   - has obtained a solid knowledge of the basic and advanced disciplines that together form Neuroscience with a focus on the neural mechanisms underlying behaviour and cognition;
   - has obtained the ability to interpret and evaluate current state-of-the-art research on clinical neurophysiology, in particular on the field of brain imaging and neurophysiology of neuropsychiatric disorders
10. In addition to paragraph 1, the student finishing the track Molecular Neurosciences has obtained the following track-specific qualifications:
    - a solid knowledge of the basic and advanced disciplines that together form Neuroscience with a focus on the molecular biology of neuronal systems, midbrain and cortex development and signal transduction;
    - solid understanding of neurodevelopment and neurodevelopmental disorders and a deepened understanding of relevant technologies applied within the field of molecular neuroscience.
11. In addition to paragraph 1, the student finishing the track Psychopharmacology and Pathophysiology has obtained the following track-specific qualifications:
    - a solid knowledge of the basic and advanced disciplines that together form Neuroscience with a focus on putative neuronal substrates, mechanisms of action and deficits underlying the most important and/or common neuropsychiatric and neurological disorders.
    - has performed an internship where he/she obtained a deeper understanding of, and at least some practical experience with, some of the most commonly used research tools, models and approaches and analytical methods to study the potential substrates, behavioural responses

and disease mechanisms implicated in these brain disorders.

12. In addition to paragraphs 1 through 11, the graduate who has chosen to do a second track-specific research project has the ability to continue his/her career either as a researcher able to pursue a PhD degree at world's best universities, as a scientist in research institutes worldwide, or as a research-skilled professional in an organisation of government, civil society or business and industry.
13. In addition to paragraphs 1 through 11, the graduate who has chosen to do a major or minor as mentioned in article B-4.4.2, obtains the exit qualifications as listed in the appendix.
14. In addition to paragraph 1, the student finishing the Double Master's programme Medicine/Biomedical Sciences has obtained the following DuMA-specific qualifications:
    - The ability to translate the observation of a clinical problem into a scientific research proposal.
    - The ability to use biomedical knowledge in a clinical context.

Chapter 3. Further admission requirements

Article B-3.1 – Admission requirements

1. A student, who has obtained a Bachelor's degree in Biomedical Sciences or a Bachelor's degree in Psychobiology or equivalent from a Dutch or foreign university, may enter the programme.
2. In addition to the requirements referred to in paragraph 1, the student has to comply with the following requirements:
    a. The Bachelor's Grade Point Average (GPA) is 6.5 or higher (according to the Dutch grading system). The GPA is the average of the Bachelor's course grades weighed by course/study load;
    b. The student has obtained the Bachelor's degree within 4 years. Exceptions to this rule can be explained in a motivation letter;
    c. The student must have completed experimental work of at least 12-15 EC. The topic of the experimental work is relevant to the track.
3. In addition to the requirements referred to in paragraph 1 and 2, the student has to comply with the entry requirements depending on the cluster or track to be followed, which are described in paragraphs 4 through 10.
4. In addition to the requirements stated in paragraph 1 and 2, to enrol in the Medical Biology Cluster advanced (2nd and 3rd year BSc level) knowledge in Molecular and Cellular biology is required.
5. In addition to the requirements stated in paragraph 1 and 2, to enrol in the track Infection and Immunity advanced (2nd and/or 3rd year BSc level) knowledge in immunology is required.
6. In addition to the requirements stated in paragraph 1 and 2, to enrol in the Neurobiology Cluster advanced (2nd and 3rd year BSc level) knowledge in Neurobiology is required.
7. In addition to the requirements stated in paragraph 1 and 2, to enrol in the track Physiology of Synapses and Networks advanced (2nd/or 3rd year BSc level) knowledge in neurobiology is required.
8. In addition to the requirements stated in paragraph 1 and 2, to enrol in the track Cognitive Neuroscience and Clinical Neurophysiology advanced (2nd/or 3rd year BSc level) knowledge in neuroscience, cognition or behaviour is required.
9. In addition to the requirements stated in paragraph 1 and 2, to enrol in the track Molecular Neuroscience advanced (2nd/or 3rd year BSc level) knowledge in molecular biology is required.
10. In addition to the requirements stated in paragraph 1 and 2, to enrol in the track Psychopharmacology and Pathophysiology advanced (2nd/or 3rd year BSc level) knowledge in neurobiology and brain disorders is required.
11. Without prejudice to the provisions of paragraphs 1 through 10 the Admissions Board may, after asking advice of the programme director, grant admission to the programme when concluding that the previous education of the candidate is equivalent to the Bachelor's degrees referred to in paragraph 1. The Admissions Board decides in such cases for every student whether the

previous education of the candidate had deficiencies for admission. An interview and test may be part of the admission procedure.

12. When the programme commences, the candidate must have fully completed the Bachelor's programme allowing admission to this Master's programme.

Article B-3.2 – Pre-master's programme

Not applicable.

Article B-3.3 – Limited programme capacity

1. The Dean will, if necessary, announce the maximum programme capacity by 1 May prior to the start of the academic year. Up to, but no more than, 240 students are admitted to the Master's Programme Biomedical Sciences as a whole.
2. Selection will be based on the following criteria, listed in no particular order:
   a. Study programme;
   b. GPA score;
   c. Study progress Bachelor's programme;
   d. Subject of Bachelor's thesis;
   e. Motivation.
3. The selection committee consisting of programme director and track coordinator(s) will judge requests for admission on criteria mentioned in article B-3.1 and select students on an individual basis and in comparison to the other applicants. The selection committee will advise the Admissions Board which will grant admission to the candidates.

Article B-3.4 – Final deadline for registration

A candidate must submit a request to be admitted to the programme through Studielink before 1 May in the case of EU/EEA/Swiss students and before 1 February in the case of non-EU/EEA/Swiss students. Under exceptional circumstances, the Admissions Board may consider a request submitted after this closing date.

Article B-3.5 – English Language Requirement for English-language Master's programmes

1. The proficiency requirement in English as the language of instruction can be met by the successful completion of one of the following examinations:
   - IELTS: 6,5, at least 6 on each sub-score (listening/reading/writing/speaking);
   - TOEFL paper-based: 580, paper-delivered at least 22 on each sub-score;
   - TOEFL Internet-based test: 92, at least 22 on each sub-score (listening/reading/writing/speaking);

   The foregoing examination must have been taken within two years before the student's enrolment.
   - C1 Advanced (CAE): minimal result 170 (overall C)
   - C2 Proficiency (CPE): minimal result 170 (overall C)

   Please note that the TOEFL-code for the University of Amsterdam is 9011..
2. An exemption from the English examination referred to in the first paragraph shall be granted to students who:
   a. had previous education in secondary or tertiary education in one of the following English-speaking countries: Australia, Canada (English), New Zealand, Ireland, the United Kingdom or the United States of America;
   b. hold an English-language 'international baccalaureate' diploma;
   c. possess a Bachelor's degree from a Dutch university satisfy the requirement of sufficient command of the English language;
   d. passed the final examination for the subject of English as part of one of the following diplomas: VWO, Belgian ASO (Flemish).

Chapter 4. Curriculum structure

Article B-4.1 – Organisation of the programme

1. The curriculum consists of the following components:
   a. General compulsory components amounting to 90-108 EC, including Research Projects and Literature Review,
   b. Specialisation-specific compulsory components amounting to 12 EC,
   c. Practical components,
   d. Elective components amounting to a maximum of 18 EC.
2. A component consists of 6 EC or a multiple thereof.

Article B-4.2 – Compulsory components

1. In the UvA Course Catalogue the content, format and examination requirements of each compulsory component of the study programme are described, indicating the preconditions that are required in order to be able to follow the course successfully.
2. For each cluster and track the compulsory components are given below:

Cluster Medical Biology – Compulsory Components						
Component	Code	Study Load	Period	Teaching Method	Test	Track(s)
Academic Development	5234ACDE0Y	0 EC	1-6	L, S, AP		all
Advanced Immunology	5234ADIM6Y	6 EC	1	L, SS & T	AP, D, OP & WE	I&I
Advanced Medical Microbiology	5234ADMM6Y	6 EC	2	L, SS & S	OP, E & WE	I&I
Advanced Microscopy	5234ADMI6Y	6 EC	1	T & PT	A & WE	CBAM
Biomedical Systems Biology	5234BISB6Y	6EC	1	A, L, T, S & SS	A & WE	MBB
Biotechnology	5234BIOT6Y	6 EC	2	L, OP, S	A & OP	MBB
Clinical Cell Biology	5234CLCB6Y	6 EC	2	L & PT	D, E & OP	CBAM & ONC
Experimental Oncology	5234EXPO6Y	6 EC	1	L & T	WE	ONC
Gastrointestinal and Cardiovascular Disease	5234GACD6Y	6 EC	2	L, PT & SS	WE	EIM
Literature Review	5234PAP12Y	12 EC	1-6	SS & PT	E	all
Making and Shaping Blood Cells	5234MSBC6Y	6 EC	2			DTB
Molecular Biology of the Cell	5234MOBC6Y	6 EC	1	L, PT & T	A, P & WE	all
Neuroendocrinology and Translational Metabolism	5234NETM6Y	6 EC	1	L, PT & SS	WE	EIM
Research Projects	52341RP00Y or 52342RP00Y	72-90 EC	1-6	PT	P, OP, & E	all
Shaping a Human	5234SHAH6Y	6 EC	1			DTB

Cluster Neurobiology – Compulsory components						
Component	Code	Study Load	Period	Teaching Method	Test	Track(s)
Academic Development	5234ACDE0Y	0 EC	1-6	L, S, AP		all
Advanced Cognitive Neurobiology and Clinical Neurophysiology	5234ACP12Y	12 EC	1	L, T & PT	A, OP, AP, E & WE	CN2
Advanced Psychopathology	5234ADP12Y	12 EC	1	L, S & T	D, E, OP & WE	PPP
From Network to Behaviour	5234NETB6Y	6 EC	2	L & S	WE	PSN
From Synapse to Network	5234SYTN6Y	6 EC	2	L, S &P	WE	PSN
Neurodevelopment/Specification of Neuronal Systems	5234NENS6Y	6EC	1	L & PT	A, OP, P & WE	MNS
Matlab Applied to Neuronal Data	5234MATN6Y	6 EC	2	L, PT & S	A, WE	CN2
Neuronal Signalling Transduction Pathways	5234NSTP6Y	6 EC	2	L & PT	A, OP, P & WE	MNS
Neurophysiology	5234NEUR6Y	6 EC	1	L, T & PT	A, AP, OP, D & WE	PSN
Stem Cell Fate and Cortical Genesis	5234SCFC6Y	6 EC	1	L & PT	A, OP, P & WE	MNS
Research Projects	52341RP00Y or 52342RP00Y	78-96 EC	1-6	PT	P, OP, & E	all
Literature Review	5224LRB12Y	12 EC	1-6	SS & PT	E	All

Abbreviations: A=Assignments; AP= Active Participation; CS=Case Study; D=Discussion; E=Essay (report, proposal, abstract etc.); L=Lectures; OE=Oral Examination; OP=Oral Presentation; P=Practical Work; PT=Practical Training; S=Seminar SS=Self Study; T=Tutorials; WE=Written Examination (paper or digital)

3. Two Research Projects should be part of the programme, unless the student opts to do a major (see article B-4.4.2.) or the Double Master's programme (see article B-4.6.5). Research Projects should have a minimum of 30 EC and a maximum of 60 EC each.

Article B-4.3 – Practical exercise

1. In addition to, or instead of, classes in the form of lectures, the elements of the master's examination programme often include a practical component as defined in article B-1.2 of part A. The UvA Course Catalogue contains information on the types of classes in each part of the programme. Attendance during practical components is mandatory.
2. When performing practical components, students must adhere to the faculty's safety regulations.
3. The student has to submit a proposal for each Research Project and the Literature Review for prior approval by the track coordinator and examiner.
4. The Research Projects and Literature Review have to be completed and assessed within the period indicated in the approval form. Research Projects and the Literature Review have to be assessed by at least two assessors.
5. In case the student fails to hand in the report/thesis within the period agreed on in the approval form, the examiner is entitled to grade the project lower or assess the component as a 'NAV.
6. A practical exercise that is completed with a pass cannot be retaken.
7. Further information on regulations and procedures about Research Projects and Literature Review can be found at the website http://student.uva.nl/bmed.

Article B-4.4 – Electives

1. Elective courses may be part of the study programme. In the UvA Course Catalogue the content, format and examination requirements of elective courses are described. The student can choose up to 18 EC of the components below without asking prior approval of the Examinations Board.

Component	Code	Study Load	Period	Teaching Method	Test
Advanced Immunology	5234ADIM6Y	6 EC	1	L, SS & T	AP, D, OP & WE
Advanced Medical Microbiology	5234ADMM6Y	6 EC	2	L, SS & S	OP, E & WE
Advanced Microscopy	5234ADMI6Y	6 EC	1	T & PT	A & WE
Biomedical Systems Biology	5234BISB6Y	6 EC	1	A, L, T, S & SS	A & WE
Biotechnology	5234BIOT6Y	6 EC	2	L, OP, S	A & OP
Brain Programming; Early-life, Epigenetics & Environment	5234BPEL6Y	6 EC	2	L & SS	WE
Clinical Cell Biology	5234CLCB6Y	6 EC	2	L & PT	D, E & OP
Current Issues in Developmental Biology	5234CIID6Y	6 EC	4 & 5	SS & T	D, E, OP
Experimental Oncology	5234EXPO6Y	6 EC	1 & 4	L & T	WE
Explore Your Options	5234CADE0Y	0 EC	1-6		
Gastrointestinal and Cardiovascular Disease	4235GACD6Y	6 EC	2	L, PT & SS	WE
Genomics	5234GENO6Y	6 EC	1	L, PT, & SS	A
Human Genome Biology and Evolution	5234HGBE6Y	6 EC	2	L, SS, & PT	WE
Laboratory Animal Course (art. 9)	5234LACA6Y	6 EC	6	L, PT & T	WE
MATLAB Applied to Neuronal Data	5234MATN6Y	6 EC	2	L, T & PT	A, OP, AP & WE
Methods and Techniques in Neurobiology	5234MTIN6Y	6 EC	2	L, P, PT & E	E & WE
Microbial Genomics (VU)	52348MIG3Y	3 EC	3	L	E
Molecular Biology of the Cell	5234MOBC6Y	6 EC	1	L, PT & T	A, P & WE
Network Models, Representation and Consciousness	5234NMRA6Y	6 EC	2	L, T & PT	A, OP, AP & WE
Neuroendocrinology and Translational Metabolism	5234NETM6Y	6 EC	1	L, PT & SS	WE
Proteomics/Metabolomics	5234PROT6Y	6 EC	2	L, PT & SS	A
Transcriptomics	5234TRAN6Y	6 EC	1	L, PT, & SS	A

Abbreviations: A=Assignments; AP=Active Participation; CS=Case Study; D=Discussion; E=Essay (report, proposal, abstract etc.); L=Lectures; OE=Oral Examination; OP=Oral Presentation; P=Practical Work; PT=Practical Training; S=Seminar SS=Self Study; T=Tutorials; WE=Written Examination

2. The student has the option to choose between one of four majors or one minor:
   - Major Science in Society;
   - Major Science Communication;
   - Major Teaching;
   - Pilot major Big Biomedical Data Analysis
   - Minor Tesla

   a. The major Science in Society and the major Science Communication consist of 60 EC. A major has to be combined with a research programme, comprising at least 60 EC (courses, Research Project and Literature Review), and with the general compulsory components in order to meet the general requirements of the programme. The final attainment levels of this major can be found in the appendix. Further information can be found on the website of the University of Amsterdam, https://student.uva.nl/bmed/shared/studentensites/fnwi/lw-gedeelde-content/en/az/majors-and-minors/majors-and-minors.html?origin=orwGDis%2BT66Tv0RT6o2xEQ.
   b. The Major Teaching consists of 60 EC. The major has to be combined with a research programme, comprising at least 60 EC (courses, research project and literature study), and with the general compulsory components in order to meet the general requirements of the programme. Students who have completed an "Educatieve Minor" of 30 EC during their Bachelor's programme may submit a non-standard study programme for approval to the Examinations Board of the 'Interfacultaire Lerarenopleidingen', after discussing this non-standard study programme with the coordinator of the Major Teaching and the coordinator of the Master's programme. Further information on this major can be found on the website of the 'Interfacultaire Lerarenopleidingen (ILO)' of the University of Amsterdam.
   c. The pilot major Big Biomedical Data Analysis consists of 60 EC.The pilot major has to be combined with a research programme, comprising at least 60 EC (courses, research project and literature study), and with the general compulsory components in order to meet the general requirements of the programme. The pilot major consists of three compulsory 6 EC courses and a 42 EC internship. Further information can be found on the website.
   d. The Minor Tesla consists of 30 EC. It must be combined with a research programme, comprising at least 90 EC (courses, research project and literature study), and with the general compulsory components in order to meet the general requirements of the programme. The minor consist of a course component and a project-based component. This project-based component has to be supervised by a Faculty examiner and is subject to prior approval of the Examinations Board. Because it is a multidisciplinary minor an examiner from the research programme has to be appointed as a second assessor. The learning objectives of this minor can be found in the appendix. Further information on this minor can be found on the website of the University of Amsterdam.
   e. Students have to go through a separate intake procedure for admission to the major in Science in Society, major in Science Communication, major Teaching, pilot major Big Biomedical Data Analysis and minor Tesla.
   f. Students first have to finish 48 EC of the obligatory research part of the programme, including the first research project, before starting one of the majors and the TESLA minor.
   g. It is not permitted to take the obligatory research part of the programme and the major or minor simultaneously.

h. The student can participate in the majors without prior approval of the Examinations Board when following the programme as described below:

Cluster Medical Biology	Programme with major	Programme with minor
General compulsory course: *Molecular Biology of the Cell*	6 EC	6 EC
Track-specific compulsory courses	12 EC	12 EC
Literature Review	12 EC	12 EC
Research Projects	30 EC	60 EC*
Major	60 EC	-
Minor	-	30 EC
Total study load	120 EC	120 EC
Cluster Neurobiology	**Programme with major**	**Programme with minor**
Track-specific compulsory courses	12-18 EC	12-18 EC
Elective courses (see paragraph 4.4.1.)	0-6 EC	0-6 EC
Literature Review	12 EC	12 EC
Research Projects	30 EC	60 EC*
Major	60 EC	-
Minor	-	30 EC
Total study load	120 EC	120 EC

** Two Research Projects with a minimum of 30 EC each*

3. If the student wishes to take a different subject than the units of study listed (see paragraph 4.4.1), advance permission must be obtained in writing from the Examinations Board. These units:
   a. have to be followed at an accredited university or institute
   b. have to be relevant to the master chosen
4. In terms of content, elective components, as referred to in paragraph 3, must not show too much similarity to the components of the student's standard curriculum. The Examinations Board will decide on the acceptable degree of similarity.
5. An elective component, as referred to in paragraph 3, will only be seen as part of the programme when the Examinations Board has given its prior approval to following this elective component.

Article B-4.5 – Free curriculum

1. Subject to certain conditions, the student has the option of compiling a curriculum of his/her own choice which deviates from the curricula prescribed by the programme.
2. The concrete details of such a curriculum must be approved before the start of the master by the most appropriate Examinations Board.
3. The free curriculum is put together by the student from the units of study offered by the University of Amsterdam and must at least have the size, breadth and depth of a regular Master's programme and is in line with the learning outcomes of the degree programme
4. The following conditions must at least have been met in order to be eligible for the Master's degree:
   a. At least 60 EC must be obtained from the regular curriculum
   b. The level of the free curriculum programme must match the objectives and exit qualifications that apply for the programme for which the student is enrolled.

Article B-4.6 – Double Master's Programme Medicine/Biomedical Sciences (DuMa)

1. The exit qualifications of the Master's programme Biomedical Sciences are also met by following the Double Master's programme Medicine/Biomedical Sciences.
2. Additional exit qualifications apply for the DuMa programme, as defined in Article B-2.2.14
3. Only students that fulfil the admission requirements for both the Medicine and Biomedical Sciences Master Programme can be admitted to the DuMa programme. In addition, an interview in which motivation and study results are assessed will be part of the admissions procedure.
4. In case a student wants to end the Double Master programme, it is possible to fall back on either the Master of Biomedical Sciences or Master of Medicine programme, as long as the conditions of the regular master programme concerned, as described in the TER, are met. In this case, the conditional exemptions are cancelled and the student will have to successfully pass all components of the regular master programme. The Examinations Board may, in individual cases, decide to make an exception to this rule.
5. The programme consists of the following parts:

Biomedical Sciences Master's programme part	
Track-specific compulsory courses (1st year)	18 EC
Literature Review	12 EC
Research Project (1st year)	30 EC
Research Proposal (Master fase 4 Master Medicine)	6 EC
Medicine Master's programme part	
Master fase 1 Master Medicine *	36 EC
Master fase 2 Master Medicine *	53 EC
Master fase 3 Master Medicine *	25 EC
Part of Master fase 4 Master Medicine *	26 EC
Total study load	*206 EC*

**See also Teaching and Examination Regulations of master programme Medicine*

Article B-4.7 – Sequence and admission requirements

1. Students may participate in examinations (and/or practical exercises) of the units below only if they have passed the examination or examinations for the units mentioned hereinafter:
   - The student has to successfully complete 12 EC of compulsory courses prior to approval and starting of the Research Project.

Article B-4.8 – Participation practical training and tutorials

Not applicable

Article B-4.9 – Exemption

1. A maximum of 60 EC of the curriculum can be accumulated through granted exemptions.
2. At the written request of the student, the Examinations Board may exempt the student from taking one or more examination components, as defined in article A-4.7.1 of part A.
3. This exemption does not apply to Research Project 2.
4. Exemptions from examinations (or parts thereof), if granted, will be valid for the same period as the validity of these examinations.

Article B- 4.10 – Validity period for results

The validity period of passed interim examinations and exemptions from interim examinations is until the end of the academic year (31 Aug).

Article B-4.11 – Degree

Students who have successfully completed their Master's examination are awarded a Master of Science degree. The degree awarded is stated on the diploma.

Article B- 4.12 – Determining results of examinations

In addition to article A-4.6 of Part A, in case the examination of a component consists of two or more parts, each part has to be graded with a 5.0 or higher to pass the examination.

Chapter 5. Academic student counselling

Article B-5.1 Academic student counselling

The academic student counselling for this programme consists of:

- access to a dedicated study advisor for all students of the Graduate School of Life and Earth Sciences,
- a career development course.

Chapter 6. Teaching evaluation

Article B-6.1 Teaching evaluation

Teaching evaluation is performed as follows:

- Course evaluations
- Curriculum evaluation

All evaluation reports are discussed within the Programme Committee.

Chapter 7. Transitional and final provisions

Article B-7.1 – Amendments and periodic review

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

Article B-7.2 – Transitional provisions

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

Old Component	Replacement in 2019-2020	Remarks
Neural Models, Representation and Consciousness	Network Models, Representation and Consciousness	The content of the course has not been changed.
Pathology, Neurogenetics and Endocrinology	Neuroendocrinology and Translational Metabolism	The content of the course has been changed. Students should contact the study advisor if a transitional provision is required.

Article B-7.3 - Publication

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

Article B-7.4 – Effective date

These Regulations enter into force with effect from 1 September, 2019.

Thus drawn up by the Dean of the Faculty of Science on 27 August, 2019.

Appendix - Final attainment levels of the major Science in Society, the major Science Communication and Major Teaching

A. Final attainment levels of the major Science in Society

Dublin descriptor 1: Knowledge and understanding
The graduate has theoretical and practical knowledge of management, policy analysis and entrepreneurship. The graduate:

1. has insight into the various relevant disciplines in the social and behavioral sciences. More specifically the student acquires insight into:
   a. important concepts and theories in the field of policy science, management studies, and entrepreneurship;
   b. the relation of these gamma sciences to the beta sciences;
2. has insight into concepts and the latest theories, research methodologies, analytical models and important research questions related to interdisciplinary research for addressing societal problems;
3. has knowledge of, and insight into, relevant concepts and theories for effective communication and collaboration.

Dublin descriptor 2: Applying knowledge and understanding
The graduate is experienced in carrying out interdisciplinary research, in applying techniques specific to the subject area and in applying scientific knowledge to societal problems. The graduate:

1. has the ability to integrate knowledge from the beta and gamma sciences, as well as from science and practice;
2. can apply scientific knowledge to formulate solutions to societal problems and assess them for appropriateness and societal relevance;
3. adopts an appropriate attitude towards the correct and unbiased use and presentation of data.

Dublin descriptor 3: Making judgments
The graduate is able to independently and critically judge information. The graduate is able to:

1. independently acquire information in relevant scientific areas through a literature review and by conducting empirical research, as well as evaluate such information critically;
2. select and order information, distinguish essentials from trivialities, and recognize connections;
3. formulate personal learning objectives and critically evaluate own performance, both introspectively and in discussion with others.

Dublin descriptor 4: Communication
The graduate is able to transfer knowledge and skills related to his/her subject area to other people and to adequately reply to questions and problems posed within society. The graduate:

1. has acquired skills to report orally and in writing on research results in English;
2. has the ability to communicate research conclusions, and the knowledge and rationale underpinning them, to specialist audiences and non-specialist audiences clearly and unambiguously;
3. can collaborate with researchers from various scientific disciplines;
4. can make essential contributions to scientific discussions about plans, results and consequences of research.

Dublin descriptor 5: Learning skills
The graduate has developed learning skills that enable him/her to continue with self-education and development within the subject area. The graduate:

1. has acquired skills to develop a research plan, giving details of the problem statement, objectives, research questions, research approach, research methods, and planning;

2. is familiar with the general scientific journals, such as Nature and Science, and with journals in the specialisation, such as Research Policy, Health Policy, Science, Technology & Human Values, Social Science & Medicine, and International Journal on Technology Management;
3. has the learning skills to allow him/her to continue to study in a manner that may be largely self-directed or autonomous (life-long learning).

B. Final attainment levels of the major Science Communication

The MSc graduate possesses an academic attitude, skills and competences to operate at the interface of science and society aiming to contribute to a fruitful science-society dialogue. This means that Master's graduates have the following focus:

- Understanding the dynamic relationship between science and society;
- Translating information from the natural sciences to society and vice versa;
- Shaping the dialogue between science and society.

Knowledge

1. Knowledge of and insight into the relevant concepts and theories in the field of science communication, sociology, communication science, philosophy and science & technology studies in relation to the natural sciences;
2. Familiarity with scientific journals in the field of science communication and science & technology studies, as well as familiarity with a variety of popular-scientific media;
3. Insight into the nature and course of interpersonal and group communication processes relevant to the formal and informal dialogue between science and society;
4. Insight into relevant concepts and theories for effective communication and collaboration in relation to diverse science-society interactions;
5. Insight into the popularization of the natural sciences in various media;
6. Insight into the roles and responsibilities of museums in science communication.

Skills

1. Independently acquire, analyze and evaluate relevant information in a variety of scientific disciplines, by conducting literature study and empirical research;
2. Communicate and collaborate effectively with diverse professionals of scientific and nonscientific disciplines as well as lay citizens;
3. Design and facilitate interactive processes in relation to the science-society dialogue;
4. Translate information from various natural science disciplines into more generally accessible language and formats;
5. Produce popular-scientific media output concerning developments in the natural sciences, aimed at a variety of publics;
6. Contribute to the design of museum exhibitions from the perspective of scientific content management and science communication theory;
7. Make an intrinsic contribution to the societal discussion of developments in science and technology.

C. Final attainment levels of the major Teaching

De bekwaamheidseisen Leraar Voorbereidend Hoger Onderwijs zijn, naast de voor alle wo-masteropleidingen geldende Dublin-descriptoren en algemene wettelijke eisen, richtinggevend voor de doelstellingen en eindtermen van de lerarenopleidingen Voorbereidend Hoger Onderwijs. Deze bekwaamheidseisen zijn vastgelegd in de Wet op het voortgezet onderwijs (artikel 36 e.v.) en het Besluit bekwaamheidseisen onderwijspersoneel (zie 'Besluit bekwaamheidseisen onderwijspersoneel' (http://wetten.overheid.nl/BWBR0018692/2017-08-01) en 'Besluit van 16 maart 2017 tot wijziging van het Besluit bekwaamheidseisen onderwijspersoneel en het Besluit bekwaamheidseisen onderwijspersoneel BES in verband met de herijking van de bekwaamheidseisen voor leraren en docenten' (https://zoek.officielebekendmakingen.nl/stb-2017-148.html)).

De eindtermen zijn geordend in twee categorieën:

- Eindtermen die rechtstreeks te maken hebben met de kern van het beroep: het onderwijsleerproces en het leren van leerlingen, te weten de vakinhoudelijke, vakdidactische en pedagogische bekwaamheid (eindterm 1 t/m 3).
- Eindtermen die betrekking hebben op meer algemene aspecten van professioneel handelen ten dienste van die kern van het beroep: te weten samenwerking met collega's en de omgeving van de school en met reflectie en persoonlijke en professionele ontwikkeling (eindterm 4 t/m 5).

De opleiding draagt er zorg voor dat de afgestudeerde Leraar VHO in ieder geval:

1. aantoonbaar beschikt over vakinhoudelijke kennis en vaardigheden die het wo-bachelorniveau overstijgen dan wel verdiepen. Dat wil zeggen dat de afgestudeerde Leraar VHO:
   a. de inhoud van vak beheerst / boven de leerstof staat;
   b. daardoor de leerstof, voor het schooltype waarin de leraar werkzaam is, zo kan samenstellen, kiezen of bewerken dat de leerlingen die kunnen leren;
   c. vanuit vakinhoudelijke expertise verbanden kan leggen met het dagelijks leven, met werk en met wetenschap en het onderwijs betekenisvol kan maken voor de leerlingen;
   d. daarmee kan bijdragen aan de algemene vorming van de leerlingen.
2. aantoonbaar beschikt over vakdidactische kennis en vaardigheden. Dat wil zeggen dat de afgestudeerde Leraar VHO:
   a. de vakinhoud weet te vertalen in leerplannen of leertrajecten en dat doet op een professionele, ontwikkelingsgerichte werkwijze;
   b. de vakinhoud leerbaar maakt voor en afstemt op het niveau en kenmerken van de leerlingen, daarbij doelmatig gebruikmakend van (digitale) beschikbare leermiddelen;
   c. het onderwijs kan ontwikkelen en evalueren;
   d. het onderwijs doelmatig kan uitvoeren en het leren van leerlingen kan organiseren;
   e. de vak inhoud/didactiek afstemt met de collega's op school en laat aansluiten bij de visie en missie van de school.
3. aantoonbaar beschikt over pedagogische kennis en vaardigheden. Dat wil zeggen dat de afgestudeerde Leraar VHO:
   a. de ontwikkeling van leerlingen volgt in hun leren en gedrag en daarop het handelen afstemt;
   b. bijdraagt aan de sociaal-emotionele en morele ontwikkeling van de leerlingen;
   c. bijdraagt aan de burgerschapsvorming en de ontwikkeling van de leerling tot een zelfstandige en verantwoordelijke volwassene;

   d. met een professionele, ontwikkelingsgerichte werkwijze en in samenwerking met collega's een veilig, ondersteunend en stimulerend leerklimaat voor leerlingen kan realiseren;
   e. in staat is om oordelen te formuleren, rekening houdend met de sociaal- maatschappelijke en ethische verantwoordelijkheden die horen bij het beroep.
4. aantoonbaar reflecteert ten behoeve van persoonlijke en professionele ontwikkeling. Dat wil zeggen dat de afgestudeerde Leraar VHO:

a. in staat is kritisch te reflecteren op alle aspecten die met zijn/haar persoonlijkheid, motivatie, attitudes, verwachtingen en cognities te maken hebben (die onder meer tot uiting komen in het pedagogisch handelen) en feedback hieromtrent ter harte te nemen
b. op onderzoeksmatige wijze de (eigen) onderwijspraktijk verbetert en blijft ontwikkelen;
c. in staat is (vak)kennis en -kunde actueel te houden;
d. in staat is een eigen positie te bepalen ten aanzien van de missie en visie van de school/instelling en bereid is een constructieve bijdrage te leveren aan de ontwikkeling van het vak/het onderwijs in de school.
5. aantoonbaar samenwerkt en communiceert met collega's en omgeving. Dat wil zeggen dat de afgestudeerde Leraar VHO:
a. het pedagogisch handelen kan afstemmen met collega's en met anderen die voor de ontwikkeling van de leerling verantwoordelijk zijn;
b. de ontwikkeling van het vak/curriculum in de school kan afstemmen met collega's en met anderen die voor de ontwikkeling van de leerling verantwoordelijk zijn.

2. Onverminderd het bepaalde in lid 1 heeft de afgestudeerde van afstudeerrichting Biologie een gedegen vakinhoudelijke kennis van en inzicht in het vakgebied en de vakdidactiek van Biologie en kan op basis daarvan aantrekkelijke, effectieve en efficiënte leeractiviteiten ontwerpen, uitvoeren, begeleiden en evalueren voor het schoolvak Biologie in de onderbouw en/of bovenbouw.
3. Onverminderd het bepaalde in lid 1 heeft de afgestudeerde van afstudeerrichting Natuurkunde een gedegen vakinhoudelijke kennis van en inzicht in het vakgebied en de vakdidactiek van Natuurkunde en kan op basis daarvan aantrekkelijke, effectieve en efficiënte leeractiviteiten ontwerpen, uitvoeren, begeleiden en evalueren voor het schoolvak Natuurkunde in de onderbouw en/of bovenbouw.
4. Onverminderd het bepaalde in lid 1 heeft de afgestudeerde van afstudeerrichting Scheikunde een gedegen vakinhoudelijke kennis van en inzicht in het vakgebied en de vakdidactiek van Scheikunde en kan op basis daarvan aantrekkelijke, effectieve en efficiënte leeractiviteiten ontwerpen, uitvoeren, begeleiden en evalueren voor het schoolvak Scheikunde in de onderbouw en/of bovenbouw.
5. Onverminderd het bepaalde in lid 1 heeft de afgestudeerde van afstudeerrichting Wiskunde een gedegen vakinhoudelijke kennis van en inzicht in het vakgebied en de vakdidactiek van Wiskunde en kan op basis daarvan aantrekkelijke, effectieve en efficiënte leeractiviteiten ontwerpen, uitvoeren, begeleiden en evalueren voor het schoolvak Wiskunde in de onderbouw en/of bovenbouw.
6. Onverminderd het bepaalde in lid 1 heeft de afgestudeerde van afstudeerrichting Aardrijkskunde een gedegen vakinhoudelijke kennis van en inzicht in het vakgebied en de vakdidactiek van Aardrijkskunde en kan op basis daarvan aantrekkelijke, effectieve en efficiënte leeractiviteiten ontwerpen, uitvoeren, begeleiden en evalueren voor het schoolvak Aardrijkskunde in de onderbouw en/of bovenbouw.
7. Onverminderd het bepaalde in lid 1 heeft de afgestudeerde van afstudeerrichting Informatica een gedegen vakinhoudelijke kennis van en inzicht in het vakgebied en de vakdidactiek van Informatica en kan op basis daarvan aantrekkelijke, effectieve en efficiënte leeractiviteiten ontwerpen, uitvoeren, begeleiden en evalueren voor het schoolvak Informatica in de onderbouw en/of bovenbouw.

D. Learning objectives of the minor Tesla

By completing the Tesla Minor the graduate is fit to start a career in demanding environments which require abilities to utilize the disciplinary science background in research, corporate, civil society, governmental and advisory work environments.
All learning objectives fall into at least one of the following categories:

1. Information processing;
2. Teamwork;
3. Project Work;
4. Communication;
5. Self-reflection.

Further information about the minor Tesla can be found in the study guide:
http://www.teslaminor.nl