

# **Teaching and Examination Regulations**

## **MASTER's Degree Programmes**

B. programme-specific section

M Biomedical Sciences (66990)

Academic year 2015-2016

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## **Section B: Programme-specific section**

### **1. General provisions**

#### **Article 1.1 Definitions**

The following definitions are used in these Regulations, next to the ones used in Section A:  
internship: work placement, practical exercise

#### **Article 1.2 Degree programme information**

1. The programme M Biomedical Sciences, CROHO number 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. A unit of study comprises 6 EC or a multiple thereof. Selected courses comprise 3 EC or a multiple thereof.

#### **Article 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 that a programme can be completed within the nominal study duration set for the programme.

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

#### **Article 2.1 Programme objective**

The programme aims to equip the student with the knowledge, skills and understanding required to operate as an independent professional within the disciplines covered by the Master's programme, and to be a suitable candidate for a subsequent career in biomedical research. The Master's graduate should be competitive in his or her field at both the national and the international levels, in relation to both PhD research programmes in national and international scientific institutions or employment in trade and industry or government. Having completed the programme, the student should have developed a critical scientific approach and an awareness of the ethical and societal aspects of the biomedical sciences in general, and the field addressed by the Master's specializations in particular. The Master's programme consists of the following specializations: Immunology, Infectious Diseases, Neurobiology, Medical and Behavioral Genomics, Psychophysiology, International Public Health, Science Communication, Specialization Science in Society and Education specialization.

#### **Article 2.2 Exit qualifications**

In all events, a graduate of the degree programme will have the following:

<p><b>Dublin descriptor 1: Knowledge and understanding</b></p> <p>The graduate should have specialized theoretical and practical knowledge of Biomedical Science notably within the field of his/her specialization.</p>
<p>The graduate:</p> <ul style="list-style-type: none"> <li>• masters the fundamental concepts of modern biomedical sciences and understands the state of the art in terms of developing theories and insight into the most important current research issues in the biomedical discipline in which the student has specialized.</li> <li>• appreciates the place of his/her specialization within the biomedical and the natural sciences.</li> <li>• is able to appreciate the scientific and social relevance of biomedical sciences, and of current research in the area of specialization.</li> <li>• is able to think in multidisciplinary terms, and possesses an understanding of other disciplines (and sub-disciplines) that are of importance to biomedical sciences.</li> <li>• has command of advanced research techniques, laboratory procedures and (statistical) methodology necessary for the specialization.</li> </ul>
<p><b>Dublin descriptor 2: Application of knowledge</b></p> <p>The graduate should be experienced in carrying out research, in applying techniques specific to the subject area and in applying scientific knowledge to problems raised in society.</p>
<p>The graduate:</p> <ul style="list-style-type: none"> <li>• is able to design experiments in the different fields associated with Biomedical Sciences</li> </ul>

<p>notably within the field of his/her specialization and analyze their results.</p> <ul style="list-style-type: none"> <li>• has knowledge about the methodology used within research of the field of his/her discipline and can apply independently these methods in research.</li> <li>• is able to apply his/her scientific knowledge to social questions.</li> <li>• can think multidisciplinary and has insight in the relevant (sub)disciplines that are important to his/ her specialization.</li> <li>• is able to reflect on the ethical aspects of research or its uses, and include these deliberations in the decision-making process.</li> <li>• adopts an attitude towards the correct and unbiased use and presentation of data.</li> </ul>
<p><b>Dublin descriptor 3: Critical judgment</b></p> <p>The graduate should be able to independently and critically judge information.</p>
<p>The graduate:</p> <ul style="list-style-type: none"> <li>• is able to independently acquire information in the field of his/ her specialization, and to analyze and critically evaluate such information.</li> <li>• is able to select and order information, to distinguish essentials from trivialities, and to recognize connections.</li> <li>• is able to independently and critically analyze research in the field of his/ her specialization, both in relation to its design, planning and execution, and to the results obtained.</li> <li>• has the ability to evaluate his/her own performance, both introspectively and in discussion with others.</li> </ul>
<p><b>Dublin descriptor 4: Communication</b></p> <p>The graduate should be able to transfer knowledge and skills related to his/her subject area to other persons and to adequately reply to questions and problems posed within society.</p>
<p>The graduate:</p> <ul style="list-style-type: none"> <li>• can report orally on research results in English with support of modern presentation techniques.</li> <li>• can report in written form on research results on the level of peer-reviewed academic journals.</li> <li>• can make essential contributions to scientific discussions about plans, results and consequences of research.</li> <li>• can collaborate with researchers from other disciplines.</li> </ul>
<p><b>Dublin descriptor 5: Learning skills</b></p> <p>The graduate should develop learning skills that enable him/her further self education and development within the subject area.</p>
<p>The graduate:</p> <ul style="list-style-type: none"> <li>• is able to understand and summarize scientific literature within the field of his/ her specialization.</li> <li>• is able to draw up a research plan, giving details of experimental design, execution and analysis.</li> <li>• is familiar with general scientific journals such as Nature and Science, and with journals in the area of his/ her specialization.</li> <li>• is familiar with computer software that is relevant to the field.</li> <li>• has been able to influence his/her personal learning process by the choice of courses.</li> </ul>

Since the master consists of different (combinations of) specializations, the profiles of students graduating from the programme are as follows:

***Immunology:***

The Master's graduate with a specialization in Immunology has a broad understanding of immunological processes, ranging from the molecular and cellular interactions between host and pathogen to an integrative knowledge of the role of the immune system in various pathologies, such as cancer, infectious diseases and autoimmunity. The Master's graduate has specialized in one of the subjects within the field of immunology. He/she possesses knowledge of current theory and the key research questions in the field of immunology and has an understanding of the scientific and social relevance of this subject area.

***Infectious diseases:***

The Master's graduate with a specialization in Infectious diseases has a broad understanding of the biology of pathogenic organisms and the interaction between pathogens and their hosts. The Master's graduate has the ability to conduct scientific research in the field of medical

microbiology and to critically assess the results of microbial research. The Master's graduate has specialized in one of the subjects within the field of medical microbiology. He/she possesses knowledge of current theory and the key research questions in this field and has an understanding of the scientific and social relevance of this subject area.

***Neurobiology:***

The Master's graduate with a specialization in Neurobiology has knowledge, insight and understanding of the multiple facets that play a role in various kinds of behavioral functions and how these are influenced by genes, environmental factors and developmental factors. The Master's graduate has the ability to conduct scientific research into these processes and can critically assess the results of neurobiological research. The Master's graduate has specialized in one of the subjects within the field of neurobiology. He/she possesses knowledge of the significance of neurobiology within the context of brain research and some of its clinical implications.

***Medical and behavioral genomics:***

The Master's graduate with a specialization in Medical and Behavioral Genomics has an understanding and knowledge of the application of genomics in studying complex disorders and traits, including mental health and neurodevelopmental disorders. In this rapidly developing field, the student's knowledge covers basic classical genetics and biometrical approaches, genetic epidemiology and genetic association and linkage methods. Skills include application of these methods not only to data from genetics and genomics platforms, but also from gene expression (transcriptomics) and endophenotypes.

***Psychophysiology:***

The Master's graduate with a specialization in Psychophysiology has a broad understanding of the functions of the central and peripheral nervous system and a special knowledge of the measurement of these functions through physiological recording techniques (cardiovascular, EEG, MRI, hormones). The Master's graduate has the ability to conduct scientific research in the field of psychophysiology and to critically assess the results of psychophysiological research. The Master's graduate has specialized in one of the subjects within the field of psychophysiology. He/she possesses practical skills in psychophysiological measurement and has knowledge of current theory and the key research questions in this field. He/she has an understanding of the scientific and social relevance of this subject area.

***International public health:***

The Master's graduate with a specialization in International public health has a broad understanding of current and future challenges in international public health, their main causes, and applied and potential interventions. The Master's graduate has specialized knowledge of relevant concepts from various disciplines, including epidemiology, policy science, anthropology, management studies, biomedical sciences and health sciences. The Master's graduate has the ability to conduct scientific research in the field of international public health and to critically assess the results of international public health research. The Master's graduate has specialized in one of the subjects within the field of international public health. He/she possesses knowledge of current theory and the key research questions in this field and has an understanding of the scientific and social relevance of this subject area.

***Communication specialization:***

Biomedical science is increasingly becoming an interdisciplinary research field in which biomedical scientists can no longer function effectively in isolation. Rather, they benefit from interaction with other scientists (such as those in the fields of molecular biology, neurobiology and immunobiology) and societal actors (such as doctors, patients and policymakers). Communication about science takes place between academic peers and between scientists and the general public. This makes the Communication specialization a complex and dynamic field

of research and practice, for example on patient participation in health research, the use and effects of media metaphors and hype, and public understanding of emergent technologies. The Master's graduate with this specialization has a theoretical understanding of the complex problems that arise during such communication processes, and has developed the necessary skills to act professionally at this interface to enhance communication and the outcomes of communication between scientific actors and society.

**Science in Society:**

The Master's graduate with a specialization Science in Society combines an academic approach with the skills and competences that will allow him or her to perform scientific research at the interface of the biomedical sciences and society. The specialization aims to develop strategies that contribute to an understanding of complex societal problems and strategies to solve complex societal problems through interdisciplinary research. In addition, the programme analyses the social, economic and ethical aspects of new developments in the biomedical sciences, so as to assess their implications for society. Master's graduates have the necessary skills to collaborate and communicate with researchers from various scientific disciplines (including but not limited to those in the life sciences) and societal actors, and the ability to use these academic insights.

**Education specialization:**

The Master's graduate with a specialization in Education (CROHO number 68502, accreditation date 1 January 2010) obtains a certificate that qualifies the graduate to teach Biology in secondary schools (this is a 'grade one' certificate, i.e. it qualifies the graduate to teach pupils who will sit public exams in the subject).

**3. Further admission requirements**

[Article 3.1 Admission requirements](#)

1. Admission to the Master's programme is possible for an individual who can demonstrate that he/she has the following knowledge and skills at the Bachelor's degree level, obtained at an institution of academic higher education:

a. knowledge

A minimum of 24EC in molecular biology and a minimum of 24EC in human biology, including at least:

- Cell biology
- Biochemistry
- Genetics
- Immunology
- Microbiology
- Statistics

And preferably

- (Human) anatomy and physiology
- Histology and pathology

b. research laboratory skills:

- Practical laboratory techniques gained in courses
- Preferably a bachelor research internship of  $\geq 12$ EC in a research laboratory in a relevant field (molecular and/or human biology). The internship should be performed at a research department within a university, academic medical center or acknowledged research institute.

c. grades:

**Holding a Bachelor's degree in Biomedical Sciences from a Dutch university or a Bachelor's degree in Gezondheid en Leven, major Biomedisch, from VU University Amsterdam:**

- Direct admission: final grade bachelor research internship/thesis in a relevant field (molecular biology or human biology) is at least 7.5 and a bachelor grade average of at least 7.0 (excluding the internship)
- Intake procedure: final grade bachelor research internship/thesis in a relevant field (molecular biology or human biology) is at least 7.0

**Holding another Bachelor's degree from a university, an international Bachelor's degree in a relevant field or a Bachelor's degree from an institute of higher education (HBO/HLO) in the Netherlands:**

- Intake procedure: final grade bachelor research internship/thesis in a relevant field (molecular biology or human biology) is at least 7.5 and a bachelor grade average of at least 7.0 (excluding the internship).
- For bachelor's degree from an institute of higher education (HBO/HLO): the average is calculated on a program of 240EC (4 years of study; including the propedeuse/first-year diploma)

d. specialization specific requirements:

- International Public Health: at least 6 EC in Epidemiology
- Education: at least 30 EC in biological courses, including at least courses in Evolution, Ecology, Biodiversity, Plant physiology and Field work

2. The Admissions Board will investigate whether the interested person meets the admission requirements.
3. In addition to the requirements referred to in the first paragraph, the Board will also assess requests for admission in terms of the following criteria:
  - competence to function at academic MSc level
  - motivation
  - assessment based on a scientific article
4. Any individual who has obtained a Bachelor's degree in academic higher education on one of the following degree programmes meets the requirements referred to in paragraph 1a and 1b :
  - a. Bachelor's degree in Biomedical Sciences from a Dutch university
  - b. Bachelor's degree in Gezondheid en Leven, major Biomedische wetenschappen, at the VU University Amsterdam
5. When the programme commences, the candidate must have fully completed the Bachelor's programme or pre-Master's programme allowing admission to this Master's programme.

**Article 3.2 Pre-Master's programme**

1. Students with a Bachelor's degree in a field that corresponds to a sufficient extent with the subject area covered by the Master's programme can request admission to the pre-Master's programme, to be assessed by the Admissions Board.
2. The pre-Master's programme comprises 6-30 EC and is made up of units of the Bachelor's programme Biomedische Wetenschappen or other Bachelor's programmes of the Faculty of Earth and Life Sciences at the VU, to be decided by the Admission Board.
3. The individual who has successfully completed their specific pre-Master's programme meets the requirements referred to in paragraph 1a and 1b, and will be either directly admitted or invited for an intake procedure.

**Article 3.3 Limited programme capacity**

Not in use.

**Article 3.4 Final deadline for registration**

A candidate must submit a request to be admitted to the programme through Studielink before the dates that are determined in the Application and Registration Regulation (at <http://www.vu.nl/en/programmes/practical/policies/index.asp>).

**Article 3.5 English language requirement for English-language Master's programmes**

1. All applicants are required to pass an English language proficiency test. (see <http://www.vu.nl/en/programmes/admission-and-application/masters/international-master/language-proficiency-requirements.asp>).

The proficiency requirement in English as the language of instruction can be met by the successful completion of one of the following examinations or an equivalent:

- Academic IELTS: 6.5
- TOEFL paper based test: 580
- TOEFL computer based test: 237 - TOEFL internet based test: 92-93

- Cambridge Advanced English (CAE): A, B or C
  - Cambridge Proficiency English (CPE): A, B or C.
2. Exemption is granted from the examination in English referred to in the first paragraph to students who, within two years of the start of the programme:
- met the requirements of the VU test in English language proficiency TOEFL ITP, with at least the scores specified in paragraph 1, or
  - had previous education in secondary or tertiary education in an English-speaking country as listed on the VU website, or
  - have an English-language 'international baccalaureate' diploma

#### Article 3.6 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 beforehand by the most appropriate Examinations Board.
3. The free curriculum is put together by the student from the units of study offered by VU University Amsterdam and must at least have the size, breadth and depth of a regular Master's programme.
4. The following conditions must at least have been met in order to be eligible for the Master's degree:
  - a. at least 63 EC must be obtained from the regular curriculum, consisting of a research specialization (at least 57 EC, including the literature thesis) and all compulsory courses (6 EC),
  - b. the level of the programme must match the objectives and exit qualifications that apply for the programme for which the student is enrolled.

#### 4. Curriculum structure

##### Article 4.1 Composition of programme

1. The programme contains the following specializations:
  - I First and/or second year Research specializations (54-60 EC):
    - Immunology
    - Infectious Diseases
    - Neurobiology
  - II Second year Research specializations (54-60 EC), only for students that started in study year 2014-2015 or earlier:
    - Medical and Behavioural Genomics
    - Psychophysiology
  - III Second year I/C/S/E specializations:
    - International Public Health (54 EC)
    - Science Communication specialization (54 EC)
    - Specialization Science in Society (54 EC)
    - Education specialization (60 EC)

##### Article 4.2 Compulsory units of study

The compulsory units of study are:

###### a. compulsory master courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method**	Type of test***	Level
Scientific Writing in English	AM_1161	3	Nov-Dec or Jan-Feb	WG	IA, PF	400
Ethics in Life Sciences	AM_470707	3	Period 3	L, WG	WR, PF, GW, PT	400
Literature thesis Biomedical Sciences*	AM_471135	9	Academic year	LD	ER, PF, PT	600



\* The literature thesis must be written within the scope of one or both research specialization(s).

b. First year: Research specialization of 54-60 EC

c. Second year: specialization of 54-60 EC, either in research or I/C/S/E.

### Article 4.3 Specializations

#### a. Research specializations

The prescribed scope of the research specializations is 54-60 EC, including:

- research internship (30 EC)
  - at least 3 courses from the specialization (18 EC)
  - choice (6-12EC) from:
    - literature thesis in the field of the specialization (9 EC);
    - an extra optional course of the specialization (6 EC)
    - an extension of the internship (3-6 EC)\*
- \* The total EC for both internships together may not exceed 66EC.

I. First and/or second year research specializations:

#### Immunology

Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Advanced Molecular Immunology and Cell Biology	AM_470656	6	Period 1	L, WG	WR, PT	500
Internship Immunology	AM_471137	30	Academic year	PR, LD	ER, PF, PT	600

Optional courses of the specialization: compulsory to obtain at least 12 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Clinical Immunology	AM_470655	6	Period 2	L, WG, PR	WR, PF, PT	500
Immunity and Diseases	AM_1031	6	Period 1	L, WG	WR	600
Molecular Infection Biology	AM_470657	6	Period 2	L, WG, PR	WR, IA, PR	600

#### Infectious diseases

Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Advanced Molecular Immunology and Cell Biology	AM_470656	6	Period 1	L, WG	WR, PT	500
Molecular Infection Biology	AM_470657	6	Period 2	L, WG, PR	WR, IA, PR	600
Internship Infectious diseases	AM_471138	30	Academic year	PR, LD	ER, PF, PT	600

Optional courses of the specialization: compulsory to obtain at least 6 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Containment Strategies of Infectious Diseases	AM_470127	6	Period 1	L, WG	WR, ER, GW, PT, PF	500
Health Geography	AM_470094	6	Period 2	L, CP	WR, CA, ER	400
Parasitology	AM_470052	6	Period 2	L, WG	WR, PT	400
Microbial genomics	?	3	Period 3	Xx	Xx	xx

Viral Oncogenesis	M_OVIRONC03	3	Period 4	L, LD	GW, PT, IA	500
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**Neurobiology**

## Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Advanced Molecular Immunology and Cell Biology	AM_470656	6	Period 1	L, WG	WR, PT	500
System Neurosciences	AM_470712	6	Period 2	IA, PT, LD	PF, IA, PT	500
Internship Neurobiology	AM_1178	30	Academic year	PR, LD	ER, PF, PT	600

Optional courses of the specialization: compulsory to obtain at least 12 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Methods in behavioral neuroscience	AM_470728	6	Period 1	L, LD	PT, WR	500
Live Cell Imaging	AM_470726	6	Period 1	L, LD, PR	PT, WR	500
Developmental Neurobiology	AM_470713	6	Period 2	L, LD, PR, PT	WR, PT, PR	500
Neuronal networks in vivo	AM_1001	6	Period 2	xxx	xxx	xxx

II. Second year research specializations, only for students that started in study year 2014-2015 or earlier:

**Medical and behavioural genomics**

## Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Statistical Genetics for Gene Finding	AM_1040	6	Period 1	L, CP	WR, IA, PR	500
Complex Trait Genetics	AM_470733	6	Period 2	L, WG	IA, ER, PT	500
Genomic Data Analysis	AM_1008	6	Period 2	L, PR	WR, IA	500
Internship Medical and behavioural genomics	AM_471142	30	Academic year	PR, LD	ER, PF, PT	600

**Psychophysiology**

## Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Internship Psychophysiology	AM_471140	30	Academic year	PR, LD	ER, PF, PT	600

Optional courses of the specialization: compulsory to obtain at least 18 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Psychophysiology	AM_470736	6	Period 1	L, PR, CP	WR, PF, PR, PT	400

Functional Brain Imaging	AM_470715	6	Period 1	L, WG, CP	WR, PT, GW	500
Experimental and clinical neuroendocrinology	AM_470700	6	Period 2	L	WR	500
Advanced Human Neurophysiology	AM_1003	6	Period 2	L, WG, CP, PR	WR, PT	600

## b. I/C/S/E specializations

- The prescribed scope of the International Public Health, Communication and Science in Society specializations is 54 EC, including:
  - Internship (30 EC)
  - At least 4 courses from the specialization (24 EC)
- The prescribed scope of the Education specialization is 60 EC

## III. Second year I/C/S/E specializations:

**International Public Health**

## Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Research Methods for Needs Assessments	AM_470817	6	Period 1	L, WG	WR, GW	400
Containment Strategies for Infectious Diseases	AM_470127	6	Period 1	L, WG	WR, ER, GW, PT, PF	500
Policy, Management and Organisation in IPH	AM_470819	6	Period 2	L, WG	WR, IA	500
Internship International Public Health	AM_471139	30	Academic year	PR, LD	ER, PF, PT	600

Optional courses of the specialization: compulsory to obtain at least 6 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Disability and Development	AM_470588	6	Period 2	L, WG	WR, IA, PF	500
Health, Globalisation and Human Rights	AM_470818	6	Period 2	L, WG	WR, GW	500
International Comparative Analyses of Health Care Systems	AM_470820	6	Period 3	L, WG	IA, PF	500

**Science Communication specialization**

## Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Research Methods for Analyzing Complex Problems	AM_1182	6	Period 1	L, WG	WR, GW	400
Science and Communication	AM_470587	6	Period 1	L, WG	WR, GW, IA	500
Research Internship Science	AM_1162 or AM_1163	30	Academic year	PR, LD	ER, PF, PT	600

Communication or Reflective Practice Internship Science Communication						
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Optional courses of the specialization: compulsory to obtain at least 12 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Science Journalism	AM_471014	6	Period 2	L, WG	WR, GW, IA	500
Communication, Organization and Management	AM_470572	6	Period 2	L, WG	WR, IA, ER	500
Science in Dialogue	AM_1002	6	Period 2	L, WG	WR, GW, IA, PT	500
Science Museology	AM_470590	6	Period 3	L, WG	WR, PT, GW	500

### Specialization Science in Society

Compulsory units of the specialization

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Research Methods for Analyzing Complex Problems	AM_1182	6	Period 1	L, WG	WR, GW	400
Analysis of Governmental Policy	AM_470571	6	Period 1	L, WG	WR, PF, GW	500
Communication, Organization and Management	AM_470572	6	Period 2	L, WG	WR, IA, ER	500
Internship Science in Society	AM_1133	30	Academic year	PR, LD	ER, PF, PT	600

Optional courses of the specialization: compulsory to obtain at least 6 EC from these courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Epidemiology	AM_1179	3	Period 3	L, WG	WR	500
Clinical Development and Clinical Trials	AM_1180	3	Period 3	L, WG	WR	500
Business Management in Health and Life Sciences	AM_470584	6	Period 2	L	WR, IA	500
Disability and Development	AM_470588	6	Period 2	L, WG	WR, IA, PF	500
Entrepreneurship in Health and Life Sciences	AM_470575	6	Period 2	L, WG	WR, IA	500
Health, Globalisation and Human Rights	AM_470818	6	Period 2	L, WG	WR, GW	500
Policy, Politics and Participation	AM_470589	6	Period 2	L, WG	PF, GW	500
Science in Dialogue	AM_1002	6	Period 2	L, WG	WR, GW, IA, PT	500

### Education specialization

Compulsory units of the specialization

\* Please consult the study guide for information about Teaching methods and Type of test

Name of course	Course code	Number	Period or	Teaching	Type of	Level
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component		of credits	semester	method*	test*	
Praktijk 1	O_MLPRAK_1	6	Ac. year			400
Praktijk 2	O_MLPRAK_2	9	Ac. Year			400
Praktijk 3	O_MLPRAK_3	15	Ac. Year			400
Didactiek 1	O_MLDIDAC_1	6	Ac. Year			400
Didactiek 2	O_MLDIDAC_2	6	Ac. Year			400
Didactiek 3	O_MLDIDAC_3	9	Ac. Year			400
Praktijk onderzoek 1	O_MLPROZ_1	3	Ac. Year			400
Praktijk onderzoek 2	O_MLPROZ_2	6	Ac. Year			400

If the student is exempted for parts of the specialisation in Education, the exempted EC have to be compensated with other mastercourses of the programme.

- c. If the student wishes to take a different course than the units of study listed, advance permission must be obtained in writing from the Examinations Board.

\*\* L= lecture, WG= work group, PR= practical, CP= computer practical, LD= literature discussion in thesis

\*\*\* WR= written examination, IA= individual assignment, GW= group work, CA= computer assignment, PF= performance, participation, portfolio, PR= practical, ER= essay, report, PT= (poster)presentation

#### 4.4 Internships

The study contains two internships, which are compulsory units of study. Each internship is 30EC, and the research internships have the option to be extended with 3-6EC. The two internships together may not exceed 66EC.

- a. Research internships:

Name of course component	Course code
Internship Immunology	AM_471137
Internship Infectious Diseases	AM_471138
Internship Psychophysiology	AM_471140
Internship Medical and Behavioural Genomics	AM_471142
Internship Neurobiology	AM_1178

- b. I/C/S/E internships:

Name of course component	Course code
Internship International Public Health	AM_471139
Internship Specialization Science in Society	AM_1133
Research Internship Science Communication	AM_1182
Reflective Practice Internship Science Communication	AM_1183

- c. Internships without specialization:

Name of course component	Course code
Internship Biomedical Sciences	AM_471158

#### 4.5 Electives

- a. First and/or second year courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Advanced Molecular Immunology and	AM_470656	6	Period 1	L, WG	WR, PT	500

Cell Biology						
Clinical Immunology	AM_470655	6	Period 2	L, WG, PR	WR, PF, PT	500
Containment Strategies of Infectious Diseases in Global Context	AM_470127	6	Period 1	L, WG	WR, ER, GW, PT, PF	500
Disability and Development	AM_470588	6	Period 2	L, WG	WR, IA, PF	500
Health Geography	AM_470094	6	Period 2	L, CP	WR, CA, ER	400
Health, Globalisation and Human Rights	AM_470818	6	Period 2	L, WG	WR, GW	500
Immunity and Disease	AM_1031	6	Period 1	L, WG	WR	600
International Comparative Analyses of Health Care Systems	AM_470820	6	Period 3	L, WG	IA, PF	500
Molecular Infection Biology	AM_470657	6	Period 2	L, WG, PR	WR, IA, PR	600
Parasitology	AM_470052	6	Period 2	L, WG	WR, PT	400
Policy, Management and Organisation in International Public Health	AM_470819	6	Period 2	L, WG	WR, IA	500
Research Methods for Need Assessments	AM_470817	6	Period 1	L, WG	WR, GW	400
Viral Oncogenesis	M_OVIRONC03	3	Period 4	L, LD	GW, PT, IA	500

## b. Second year courses

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Advanced Human Neurophysiology	AM_1003	6	Period 2	L, WG, CP, PR	WR, PT	600
Analysis of Governmental Policy	AM_470571	6	Period 1	L, WG	WR, PF, GW	500
Business Management in Health and Life Sciences	AM_470584	6	Period 2	L	WR, IA	500
Clinical development and clinical trials	AM_470585	6	Period 3	L, WG	WR	500
Communication, Organization and Management	AM_470572	6	Period 2	L, WG	WR, IA, ER	500
Complex Trait Genetics	AM_470733	6	Period 2	L, WG	IA, ER, PT	500
Entrepreneurship in Health and Life	AM_470575	6	Period 2	L, WG	WR, IA	500

Sciences						
Experimental and clinical neuroendocrinology	AM_470700	6	Period 2	L	WR	500
Functional Brain Imaging	AM_470715	6	Period 1	L, WG, CP	WR, PT, GW	500
Genomic Data Analysis	AM_1008	6	Period 2	L, PR	WR, IA	500
Policy, Politics and Participation	AM_470589	6	Period 2	L, WG	PF, GW	500
Psychophysiology	AM_470736	6	Period 1	L, PR, CP	WR, PF, PR, PT	400
Qualitative and Quantitative Research Methods	AM_470582	6	Period 1	L, WG	WR, GW	400
Science and Communication	AM_470587	6	Period 1	L, WG	WR, GW, IA	500
Science in Dialogue	AM_1002	6	Period 2	L, WG	WR, GW, IA, PT	500
Science Journalism	AM_471014	6	Period 2	L, WG	WR, GW, IA	500
Science Museology	AM_470590	6	Period 3	L, WG	WR, PT, GW	500
Statistical Genetics for Gene Finding	AM_1040	6	Period 1	L, CP	WR, IA, PR	500

#### Article 4.6 Sequence of examinations

Students may participate in practical exercises (as listed under Art. 4.4) for the unit below only if they have passed examinations for the units mentioned:

For the first year internship:

- Internship Immunology (AM\_471137)  
The student **attended** the course AM\_470656, Advanced Molecular Immunology and Cell Biology  
**And** the student has **acquired** 18EC of the following courses:  
AM\_470656, 6EC, Advanced Molecular Immunology and Cell Biology  
AM\_1031, 6EC, Immunity and Disease  
AM\_470655, 6EC, Clinical Immunology  
AM\_470657, 6EC, Molecular Infection Biology
- Internship Infectious Diseases (AM\_471138)  
The student **attended** the courses AM\_470656, Advanced Molecular Immunology and Cell Biology and AM\_470657, Molecular Infection Biology  
**And** the student has **acquired** 18EC of the following courses:  
AM\_470656, 6EC, Advanced Molecular Immunology and Cell Biology  
AM\_470127, 6EC, Containment Strategies of Infectious Diseases in Global Context  
AM\_470052, 6EC, Parasitology  
AM\_470094, 6EC, Health Geography  
AM\_470657, 6EC, Molecular Infection Biology  
M\_OVIRONC03, 3EC, Viral Oncogenesis
- Internship Neurobiology (AM\_1178)  
The student **attended** the courses AM\_470656, Advanced Molecular Immunology and Cell Biology and AM\_470712, System neurosciences

**And** the student has **acquired** 18EC of the following courses:

- AM\_470656, 6EC, Advanced Molecular Immunology and Cell Biology
- AM\_470712, 6EC, System Neurosciences
- AM\_470728, 6EC, Methods in behavioral neuroscience
- AM\_470726, 6EC, Life Cell Imaging
- AM\_470713, 6EC, Developmental Neurobiology
- AM\_1001, 6EC, Neuronal networks in vivo

For the second year internship:

- In general: the student must have finished the first internship

- Internships Immunology, Infectious Diseases and Neurobiology: see first year internships
- Internship Psychophysiology (AM\_471140)  
The student has **acquired** 18EC of the following courses:  
AM\_470715, 6EC, Functional Brain Imaging  
AM\_470736, 6EC, Psychophysiology  
AM\_1003, 6EC, Advanced Human Neurophysiology  
AM\_470700, 6EC, Experimental and clinical neuroendocrinology
- Internship Medical and Behavioral Genomics (AM\_471142)  
The student has **passed** the following courses:  
AM\_470733, 6EC, Complex Trait Genetics  
AM\_1008, 6EC, Genomic Data Analysis  
AM\_1040, 6EC, Statistical Genetics for Gene Finding
- Internship International Public Health (AM\_471139)  
The student has **passed** the following courses:  
AM\_470817, 6EC, Research Methods for Need Assessments  
AM\_470127, 6EC, Containment Strategies of Infectious Diseases in Global Context  
AM\_470819, 6EC, Policy, Management and Organization in International Public Health
- Internship Communication specialization (AM\_1162 or AM\_1163)  
The student has **passed** the following courses:  
AM\_1182, 6 EC, Research Methods for Analyzing Complex Problems  
AM\_470587, 6 EC, Science and Communication  
**And** the student has **acquired** 6EC of the following courses:  
AM\_470572, 6EC, Communication, Organization and Management  
AM\_1002, 6EC, Science in Dialogue  
AM\_471014, 6EC, Science Journalism  
AM\_470590, 6EC, Science Museology
- Internship Science in Society (AM\_1133)  
The student has **passed** the following courses:  
AM\_1182, 6 EC, Research Methods for Analyzing Complex Problems  
AM\_470571, 6 EC, Analysis of Governmental Policy  
AM\_470572, 6 EC, Communication, Organization and Management

Students may participate in examinations for the unit below only if they have passed an examination for the unit mentioned:

- Research Methods for Need Assessments (AM\_470817) after passing a course in Epidemiology and SPSS (6EC) (preferably AB\_470180, Epidemiology).

#### Article 4.7 Participation in practicals and assignments

1. In the case of a practical, the student must attend 100% of the practical sessions. Should the student attend less than 100%, he/she must repeat the practical, or the examiner of the course may have one or more supplementary assignments issued.
2. In the case of a work group with assignments, the student must attend 100% of the work group sessions. Should the student attend less than 100%, he/she must repeat the work group, or the examiner of the course may have one or more supplementary assignments issued.
3. In exceptional circumstances, the Examinations Board may, at the request of the student, permit an exemption from this requirement if, in the opinion of the Board, the assessment of the intended skills is also possible with a lesser percentage of participation, with or without the imposition of supplementary requirements.

#### Article 4.8 Maximum exemption

A maximum of 40EC of the curriculum can be accumulated through granted exemptions, based on previous results within other master's programmes within the Life Sciences.

- either a maximum 40 EC can be accumulated from a *completed* master programme with a duration of two years (120 EC)
- or a maximum of 20 EC can be accumulated from a *completed* master programme with a duration of one year (60 EC)



**Article 4.9**      **Validity period for results**

As laid down in article 4.8 of TER part A.

**Article 4.10**      **Degree**

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

**5. Transitional and final provisions****Article 5.1**      **Amendments and periodic review**

1. Any amendment to the Teaching and Examination Regulations will be adopted by VU: the faculty board after taking advice from the relevant Board of Studies. A copy of the advice will be sent to the authorised representative advisory body.
2. An amendment to the Teaching and Examination Regulations requires the approval of the authorised representative advisory body if it concerns components not related to the subjects of Section 7.13, paragraph 2 sub a to g and v, as well as paragraph 4 of the WHW and the requirements for admission to the Master's programme.
3. An amendment to the Teaching and Examination Regulations can only pertain to an academic year that is already in progress if this does not demonstrably damage the interests of students.

**Article 5.2**      **Transitional provisions**

Notwithstanding the current Teaching and Examination Regulations, the following transitional provisions apply for students who started the programme under a previous set of Teaching and Examination Regulations:

**1. Compulsory components that have been replaced**

The compulsory components below have been replaced in academic year 2012-2013

a. *Medical and Behavioral Genomics*

<b>New component</b>	<b>Former component</b>
AM_1008 Genomic Data Analysis (6 EC)	AM_470725 Bioinformatics (6 EC)

**2. Compulsory components that do not apply for students that started before 2014-2015**

For students who started their program before academic year 2014-2015 the courses below are no longer compulsory, but form part of a restricted choice. At least three out of these four optional courses must be selected:

- M\_CCLINBIO09      Clinical and Biophysical Aspects of Cardiovascular Diseases and Imaging (6 EC)
- M\_CPATHO09      Pathophysiology of Heart and Circulation (6 EC)
- M\_CREMODE09      Remodelling of the Circulatory System (6 EC)
- M\_CVASCFU09      Vascular Function and Metabolic Diseases (6 EC)

**3. Compulsory components that do not apply for students that started before 2011-2012**

For students who started their program before academic year 2011-2012 the courses below are not compulsory:

a. *Immunology*

- AM\_470656 Advanced Molecular Immunology and Cell Biology (6 EC)

**4. Compulsory components that do not apply for students that started before 2010-2011**

For students who started their programme before academic year 2010-2011 the courses below are not compulsory:

a. *Infectious Diseases*

- 470656 Advanced Molecular Immunology and Cell Biology (6 EC)
- 470657 Molecular Infection Biology

b. *Cardiovascular Diseases*

- 3120001 Clinical and Biophysical Aspects of Cardiovascular Diseases and Imaging (6 EC)
- 430114 Pathophysiology of Heart and Circulation (6 EC)

- 3120002 Remodelling of the Circulatory System (6 EC)
- 3120003 Vascular Function and Metabolic Diseases (6 EC)

#### 5. **Compulsory components that were removed from the curriculum**

The following compulsory components have been removed from the curriculum in academic year 2014-2015:

- a. *Medical and Behavioral Genomics*
- AM\_470729 Gene Hunting (6 EC)

Students who have already successfully completed this course before 1 September 2014 can use it as an elective course.

The following compulsory components have been removed from the curriculum in academic year 2013-2014:

- b. *All specialisations:*
- AM\_471017 History of Life Sciences

Students who have already successfully completed this course before 1 September 2013 can use it as an elective course.

#### 6. **Elective components that have been replaced**

The elective components below have been replaced in academic year 2011-2012:

- a. *Psychophysiology*

<b>New component</b>	<b>Former component</b>
AM_1003 Advanced Human Neurophysiology (6 EC)	470727 In Vivo Neurophysiology (6 EC)
AM_470700 Neuroendocrinology (6 EC)	815056 Cognition and Attention (5 EC)

- b. *Immunology*

<b>New component</b>	<b>Former component</b>
M_OIMMUO3 Immunity and Diseases (6 EC)	311103 Mastercourse Immunity (6 EC)

- c. *Societal*

<b>New component</b>	<b>Former component</b>
AM_1002 Science in Dialogue (6 EC)	470590 Science Communication through Museums (6 EC)

- d. *Communication*

<b>New component</b>	<b>Former component</b>
AM_1002 Science in Dialogue (6 EC)	471007 Interpersoonlijke communicatie (Interpersonal communication) (3 EC) en 470562 Interactieve communicatie (Interactive Communication) (3 EC)

- e. From 1 September 2011 students obtain the new courses, unless they passed the former ones.

#### 7. **Total of 120 EC**

The final examination program should always total at least 120 EC.

#### Article 5.3 Publication

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

**Article 5.4**      **Effective date**

These Regulations enter into force with effect from 1 September 2015

Advice from Board of Studies, Biomedical Sciences, on 28 May 2015

Approved by authorised representative advisory body, on 15 July 2015

Adopted by the faculty board, on 21 August 2015