

**Master degree programmes
Biomedical Sciences
Medical Pharmaceutical Sciences**

Appendices to the Teaching and Examination Regulations 2011-2012

Appendix A Teaching outcomes of the degree programme (art. 1.3)

Graduates Biomedical Sciences (BMS) and Medical Pharmaceutical Sciences (MPS):

- 1 have detailed understanding of the scientific disciplines on the interface between molecular and cellular biology, integrative physiology and behaviour, and medical/pharmaceutical sciences, providing a tailored framework continuing into acquisition of in depth knowledge on:
 - (the assessment of) health maintenance and development of disease (for BMS graduates), or
 - applying drug intervention of diseases, covering the whole range of drug development disciplines from basic drug target discovery and molecular modeling of new entities and molecular targets, to pharmacoepidemiology and post marketing surveillance (for MPS graduates)
- 2 are capable of designing and conducting scientific research
- 3 are capable of independently investigating, and critically evaluating, scientific literature
- 4 are capable of identifying new developments in the relevant disciplines, and to become familiar with these developments
- 5 are organised and creative in the approach to scientific research and complex problems
- 6 can participate in, and contribute to, a multidisciplinary team
- 7 can effectively communicate acquired knowledge, insights and skills to others, both in writing and in oral presentation
- 8 are aware of the potential societal and ethical implications of scientific research, and are able to critically reflect on their actions in this context
- 9 are prepared for a professional career, either in science or in policy & management

Appendix B Specializations of the degree programme (art. 2.2)

1. Within the degree programmes, the student chooses one of the following specializations:
 - a. P-profile ("PhD-profile") which provides training as a researcher;
 - b. M-profile ("Science, Business and Policy -profile") which prepares for professions in a societal, political and/or commercial context.
2. Within the degree programme Biomedical Sciences students can follow the specialization Biology of Ageing which provides training as a researcher mainly in the field of ageing and age-related pathologies.
3. Within the degree programme Medical Pharmaceutical Sciences students can follow the specialization Toxicology and Drug Disposition which provides training as a researcher mainly in the field of adverse drug reactions.

Appendix C Content of the degree programme (art. 2.3)

1. The degree programmes consist of either the P- or the M-profile:

P-profile:

module	ECTS	entry requirements	assessment	practical
research project (RP)*	40 or ≥	-	technical and/or laboratory skills, written report, oral presentation	x
research project (RP)*	30 or ≥	-	technical and/or laboratory skills, written report, oral presentation	x
colloquium	5	RP	oral presentation	x
essay	5	-	written report	x
optional modules	20	see appendix D	see appendix D	see app. D
electives**	≤ 20	see appendix D	see appendix D	see app. D

M-profile:

module	ECTS	entry requirements	assessment	practical
research project (RP)*	40 or ≥	-	technical and/or laboratory skills, written report, oral presentation	x
optional modules	5	see appendix D	see appendix D	see app. D
colloquium	5	RP	oral presentation	x
<i>stagetraject bedrijf en beleid</i>	40	RP	performance, written report, reflection report	x
module <i>beleid en bedrijf</i>	20	-	assignment, exam	x
electives**	≤ 10	see appendix D	see appendix D	see app. D

2. In addition to the above scheme the following rules apply to all programmes:

- the first research project must be performed at the School of Life Sciences or the University Medical Center Groningen under supervision of one of the examiners.
- ** the student may choose to use 5 - 20 ECTS to extend a research project, attend extra optional modules (see appendix D) or non-scheduled electives from the pharmacy master programme, do a maximum of 10 ECTS on bachelor modules from one of the bachelor programmes of the school of life sciences, or perform an extra research assignment of 5, 10, 15 or 20 ECTS. During the midterm review one may extend the research project with 5-10 ECTS only.
- research projects, colloquium and essay must deal with different research subjects, must be supervised by a different examiner, and be approved of by the Board of Examiners.
- the student chooses a mentor from the list of each Master programme to advise and discuss the contents of the individual degree programme before approval of the Board of Examiners
- all elements in the individual programme must be approved of by the Board of Examiners.

3. **Additional requirements for the master programme Medical Pharmaceutical Sciences:**

- the module Drug Development is compulsory.

4. **Additional requirements for the track Biology of Ageing** (specialization within the master programme Biomedical Sciences):

- students follow the P-profile scheme,
- topics of both research projects are chosen within the biology of ageing research area and must be approved by the track coordinator,
- 20 ECTS modules are done as follows:

a. compulsory modules (10 ECTS)

module	ECTS	entry requirements	assessment	practical
current themes in healthy ageing	5	-	written exam, assignment	x
molecular biology of ageing and age-related diseases	5	-	written exam, oral presentation, assignment	x

b. 10 ECTS from the following list:

module	ECTS	entry requirements ¹	assessment	practical
advanced metabolism & nutrition	5	metabolisme & voeding or integratieve neurobiologie	written exam, assignment	x
immunology: from bedside to bench and back	5	immunologie I+II	written exam, oral presentation, report	x
neurodegenerative diseases	5	integratieve neurobiologie	written exam, oral presentation	x
stem cells & regenerative medicine	5	regenerative medicine, mol. biologie & med. biologie or immunology I	oral presentation, written report	x

¹ Entry requirements usually refer to modules out of bachelor programmes of the school of life sciences. Student who did not successfully follow these bachelor modules shall include these modules within the electives of the master programme

5. **Additional requirements for the track Toxicology and Drug Disposition** (specialization within the master programme Medical Pharmaceutical Sciences):

- students follow the P-profile scheme,
- topics of both research projects are chosen within the toxicology and drug disposition research area and must be approved by the track coordinator,
- 20 ECTS modules are done as follows:

a. compulsory modules (15 ECTS)

module	ECTS	entry requirements ¹	Assessment	practical
drug development	5	-	written exam, assignment	x
molecular toxicology	5	-	written exam, assignment	x
advanced pharmacokinetics	5	fakin, metox	written exam, assignment	x

b. a minimum of 5 ECTS from the following list:

module	ECTS	entry requirements ¹	assessment	practical
pharmacovigilance	3		assignment (oral presentation, report)	x
animal and human experimentation (or handling laboratory animals)	5 (or 4)	-	written exam, assignment	x
reproductive toxicology	5	metox, far-epi	assignment	x
innovative drug types	5	fakin	written exam, report	x

¹ modules from the bachelor programme pharmacy/pharmaceutical sciences. A student who did not successfully follow these bachelor modules shall include these modules within the electives of the master programme.

Appendix D Optional modules (art. 2.4) and Appendix E Entry requirements and compulsory order of examinations (art. 3.2)

The following list presents optional modules for each programme. After consultation with the study mentor, students can also choose modules from related programmes. Entry requirements usually refer to modules out of bachelor programmes of the school of life sciences. Students who did not successfully follow these bachelor modules shall include these modules within the electives of the master programme.

General modules within the School of Life Sciences

module	ECTS	entry requirements	assessment	practical
advanced imaging techniques	5	-	written exam, oral presentation	x
advanced statistics	5	biostatistics	written exam	
animal and human experiment.: design, practice and ethics (or handling laboratory animals)	5 (or 4)	a supervisor approved planning of a master subject involving human or animal experimentation	theoretical exam, assignment	x
behavioural pharmacology	5	-	written exam, oral presentation	x
introduction to the behavioural and cognitive neurosciences	4	-	written reports	x
module <i>beleid & bedrijf</i>	10, 20	-	assignment	x
orientation on international scientific careers	5	-	assignment	x
programming in C++ for biologists	5	-	assignment	x
radioisotopes in experimental biology	5	-	laboratory skills, written exam	x

Modules organised for Biomedical sciences

module	ECTS	entry requirements	assessment	practical
advanced metabolism & nutrition	5	metabolisme & voeding or integratieve neurobiologie	written exam, assignment	x
current themes in healthy ageing	5	-	written reports, oral presentation	x
current themes in inflammation and cancer	5	immunologie I	written exam, oral presentation	x
immunology: from bedside to bench and back	5	immunologie I+II	written exam, oral presentation, report	x
molecular biology of ageing and age-related diseases	5	-	written exam, oral presentation, assignment	x
neurodegenerative diseases	5	integratieve neurobiologie	written exam, oral presentation	x
nutrigenomics research	5	metabolisme & voeding or integratieve neurobiologie or advanced metabolism & nutrition	written exam, assignment	x
stem cells & regenerative medicine	5	regenerative medicine or mol. biologie & med. biologie or immunologie I	oral presentation, written report	x

Modules organised for Medical pharmaceutical sciences

module	ECTS	entry requirements	assessment	practical
advanced pharmacokinetics	5	fakin	written exam, assignment	x
drug development	5	-	written exam, assignment	x
innovative drug types	5	fakin	written exam, report	x
medicinal natural products	10	-	reports	x
molecular toxicology	5	fakin, metox	exam, assignment	x
pharmaceutical biology practical	6	-	reports	x
pharmaceutical biotechnology	6	-	reports	x
pharmaco-economics	5	-	written exam, assignments	x
pharmacoepidemiology in practice	5	-	presentation, report	x
pharmacovigilance	3, 5	-	written exam, assignment	x
reproductive toxicology	5	metox, far-epi	assignment	x
selected topics in molecular pharmacology	3	receptorfarmacologie	oral exam	

Modules organized for Molecular biology and biotechnology

Module	ECTS	entry requirements	assessment	practical
DNA micro-array analysis	5	microbiologie en genetica research or equivalent	report, oral presentation	x
biocatalysis and green chemistry	5	(bio)organische chemie, moleculen & reactiviteit, or equivalent	written exam, assignments	x
topics in enzymology	5	-	written exam	x

Modules organized for Educatie & communicatie

module	ECTS	entry requirements	assessment	practical
<i>communiceren en presenteren</i>	5	-	assignments	x
<i>ontwerpen</i>	10	-	assignments	x
<i>wetenschap in beeld</i>	5	-	assignments	x
<i>wetenschapsvoorlichting en -journalistiek</i>	5	communiceren en presenteren	assignments	x

Electives organized by the Donald Smits Center for Information Technology:

elective (max 2 ects per individual programme*)	half day unit*	assessment	practical
Access basics	5	assignments	x
Excel basics	5	assignments	x
Excel data bases en draaitabellen	1	assignments	x
Internet Publishing met FrontPage	3	assignments	x

*A minimum of 5 half day units is required for a study load of 1 ECTS, for 2 ECTS 11 units are needed.

Appendix F Admission to the degree programme and different specializations (art. 4.1.1 + art. 4.2)

1. Requirements for admission to the master degree in Biomedical Sciences

Holders of the following Bachelor's degrees from the University of Groningen are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Biomedical Sciences on that basis:

- a Bachelor's degree in Biology with one of the following majors:
 - > Biomedische wetenschappen,
 - > Moleculaire levenswetenschappen plus the minor Biomedische wetenschappen/Gedrag en neurowetenschappen.
- a Bachelor's degree in Life Science & Technology with one of the following majors:
 - > Biomedische Wetenschappen,
 - > Moleculaire levenswetenschappen plus the minor Biomedische wetenschappen/Gedrag en neurowetenschappen,
 - > Medisch farmaceutische wetenschappen plus the minor Biomedische wetenschappen/Gedrag en neurowetenschappen.
- a Bachelor's degree in Pharmaceutical Sciences plus the minor Biomedische wetenschappen/Gedrag en neurowetenschappen.

2. Requirements for admission to the master degree in Medical Pharmaceutical Sciences

Holders of the following Bachelor's degrees from the University of Groningen are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Medical Pharmaceutical Sciences on that basis:

- a Bachelor's degree in Pharmacy or Pharmaceutical Sciences
- a Bachelor's degree in Life Science & Technology with one of the following majors:
 - > Medisch farmaceutische wetenschappen,
 - > Biomedische wetenschappen,
 - > Moleculaire levenswetenschappen.
- a Bachelor's degree in Biology with one of the following majors
 - > Biomedische wetenschappen,
 - > Moleculaire levenswetenschappen.

Appendix G Application deadlines for admission (art. 4.5.1)

Deadline of Application	Non-EU students	EU students
Biomedical Sciences	April 15 th 2012	June 1st 2012
Medical Pharmaceutical Sciences	April 15 th 2012	June 1st 2012

Decision deadlines (art. 4.5.3)

Deadline of Decision	Non-EU students	EU students
Biomedical Sciences	June 15 th 2012	July 1st 2012
Medical Pharmaceutical Sciences	June 15 th 2012	July 1st 2012