Master's degree programmes
Biomedical Sciences,
Medical Pharmaceutical Sciences

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

The graduate:

1A Biomedical Sciences has detailed knowledge of the scientific disciplines on the interface between molecular and cellular biology, integrative physiology and behaviour and medical sciences providing in depth knowledge on health maintenance and development of disease.

1B Medical Pharmaceutical Sciences has detailed knowledge of one of the scientific disciplines within the area of drug intervention of diseases, covering the whole range of drug development disciplines from basic drug target discovery and molecular modeling of new chemical entities and molecular targets, to pharmacoepidemiology and post marketing surveillance

2 is capable of designing and conducting scientific research

3 is capable of independently investigating, and critically evaluating, scientific literature

4 is capable of identifying new developments in the relevant disciplines, and to become familiar with these developments

5 is 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 is aware of the potential societal and ethical implications of scientific research, and is able to critically reflect on his/her actions in this context

9 is prepared for a professional career, either in science or in management & policy

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

1. Within the degree programmes, the student chooses one of the following profiles:
   a. degree profile P-variant, "PhD-variant", which provides training as a researcher
   b. degree profile, M-variant, "Management and policy-variant " which prepares for professions that require the application of knowledge of the scientific domains of the degree programs in a societal, political and/or commercial context.
2. 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-variant:

P- variant:

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-variant:

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
policy & management internship	40	RP	performance, written report, reflection report	x
science in policy & management	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 master modules (no more than 10 ECTS on bachelor modules), or perform an extra research assignment of 5, 10, 15 or 20 ECTS. During the mid-term assessment 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 - an assistant professor or professor 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 <u>Medical Pharmaceutical Sciences</u>**: the module Introduction Medical Pharmaceutical Sciences is compulsory. Students do this module as one of the electives.

4. **Additional requirements for the track <u>Toxicology and Drug Disposition</u>** (specialization within the master programme Medical Pharmaceutical Sciences):

   - Students follow the P-variant scheme.

   - The 20 ECTS modules are done as follows:

   a. Compulsory modules (10 ECTS)

Module	ECTS	entry requirements[1]	Assessment	practical
molecular toxicology	5	fakin, metox	exam, assignment	x
pharmacokinetics II	5	fakin, metox	exam, assignment	x

   b. A selection of 10 EC from the following list:

Module	ECTS	entry requirements[1]	assessment	practical
clinical toxicology	4		assignment	x
drug side effects & post marketing surveillance	3-9	far-epi, 2 'GG-vakken'	assignment (oral presentation, report)	x
animal and human experimentation or (handling laboratory animals)	5 (4)	- -	exam, assignment	x
proteomics/genomics	5		exam, assignment	x
teratogenesis	5	metox, far-epi	assignment	x

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

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

The following list presents optional modules. The column on the right indicates the master programmes for which the modules where developed in particular. w.t.= working title.

General modules within the School of Life Sciences

Module	ECTS	entry requirements	assessment	practical
beta, business & policy	10, 20	-	assignment	x
animal and human experimentation: design, practice and ethics (or handling laboratory animals)	5 (or 4)	-	theoretical exam, assignment	x
orientation on international scientific careers	5	-	assignment	x
radioisotopes in experimental biology	5	-	laboratory skills, written exam	x
advanced statistics (w.t.)	5	biostatistiek	written exam	x
programming C++	5	-	assignment	x

Modules organised for biomedical sciences

module	ECTS	entry requirements	assessment	practical
advanced imaging techniques (w.t.)	5	-	written exam, oral presentation	x
advanced metabolism & nutrition (w.t.)	5	metabolisme & voeding	written exam, assignment	x
behavioural pharmacology	5	-	written exam, oral presentation	x
introduction BCN	5	-	written reports	x
current themes in healthy aging	5	-	written reports, oral presentation	x
current themes in inflammation and cancer	5	immunologie I	written exam, oral presentation	x

immunology: from bench to bed (w.t.)	5	immunologie I+II	written exam, oral presentation, report	x
neurodegenerative diseases	5	integratieve neurobiologie	written exam, oral presentation	x
nutrigenomics (w.t.)	5	metabolisme & voeding	written exam, assignment	x
stem cells & tissue engineering	5	regenerative medicine or moleculaire biologie & medische biologie, or immunologie I	oral presentation, written report	x

Modules organised for medical pharmaceutical sciences

module	ECTS	entry requirements	assessment	practical
introduction MPS**	5	-	lectures, assignment	x
molecular toxicology	5	fakin, metox*	exam, assignment	x
teratogenesis	5	metox, far-epi*	assignment	x
analysis of naturally-occurring substances	6	bioorg. chemie, FAA, FAB*	reports, presentation	x
clinical toxicology	4	-	mandatory attendance, presentations	x
drug side effects & post marketing surveillance	3-9	Farepi, 2 GG-vakken*	assignment (oral presentation, report)	x
drug synthesis	6 – 9	-	report	x
farmacoeconomics	6 – 11	-	exam, assignments	x
innovative drug types	4	Fakin, TBF*	written exam	
molecular modelling	5	CZS*	assignments	x
molecular pharmacology practical	6 – 9	FARP*	reports	x
neurochemistry practical	3 – 9	-	reports	x
pharmaceutical biology practical	6	bioorg. chemie, FAA, FAB	reports	x
pharmaceutical biotechnology	6	-	reports	x
pharmacoepidemiology in practice	3 – 9	Farepi, 2 GG-vakken*	presentation, report	x
pharmacokinetics II	4	Fakin*	written exam	x
protein and peptide analysis	3	FAC*	reports	x
selected topics in molecular pharmacology	3	-	oral exam	

* these entry requirements are modules from the bachelor programme in pharmacy/ pharmaceutical sciences
** for students Medical Pharmaceutical Sciences only

Modules organized for molecular biology and biotechnology

Module	ECTS	entry requirements*	assessment	practical
DNA micro-array analysis	5	microbiology and genetics research or equivalent	report, presentation	x
biocatalysis and green chemistry	5	biochemie, (bio)org. chemie, moleculen en reactiviteit or equivalent.	exam, assignments	x
protein crystallography 2	5	advanced protein crystallography	exam	x
topics in enzymology	5	biochemistry	exam	x

* these entry requirements are modules from the bachelor programme in biology or chemistry

Modules organized for educatie & communicatie*

Module	ECTS	entry requirements	assessment	practical
communiceren en presenteren (compres)	5	Com. Vaardigh.**	assignments	x
ontwerpen	10	compres	assignments	x
wetenschap, media en publiek	10	compres	assignments	x

* These modules are instructed in Dutch
** Bachelor module FWN

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 <u>Biomedical Sciences</u>
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 major *Biomedische Wetenschappen*, or major *Moleculaire Levenswetenschappen* plus the minor '*Biomedische wetenschappen/Gedrag en Neurowetenschappen*'.

- a Bachelor's degree in Life Science & Technology with major *Biomedische Wetenschappen*, or major *Moleculaire Levenswetenschappen* 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 <u>Medical Pharmaceutical Sciences</u>
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 Medicine

- a Bachelor's degree in Biology or Life Science & Technology with major *Biomedische Wetenschappen*, or *Moleculaire Levenswetenschappen*.

Appendix G Application deadlines for admission (art. 4.5)
Applications for admission to the degree programmes and given modules must be submitted to the Admissions Board before 15 April (non EU/EEA students) or 1 June (EU/EEA students).