faculty science and engineering		pharmacy

Assessment Plan
Bachelor Pharmacy
2022-2023

Introduction

This assessment plan is a description of the testing and assessment modes for all study components in the curriculum of the Bachelor's degree programme Pharmacy 2022-2023. The plan is based on the assessment policy of the Faculty of Science and Engineering, as outlined the FSE Quality Assurance Manual 2016 (Chapter 6: Assessment) and the protocol describing the duties and powers of the Faculty's Board of Examiners (February 2017).

The assessment plan for the curriculum consists of the following parts:

1. Objective(s) of the degree programme.
2. Learning outcomes of the degree programme.
3. Descriptions of the study components, as set out in the appendices to the Teaching and Examination Regulations of the degree programme.
4. Descriptions of the content of each study component in Ocasys, the online course catalogue. The following elements are relevant in this context:
   - objectives;
   - description of content;
   - lecturers;
   - assessment mode(s) and calculation of final mark;
   - mode(s) of instruction.
5. Overview of the examiners (Appendix 2) and the assessment mode for each study component. This overview is based on the curriculum approved by the Programme Committee, as included in the appendices to the Teaching and Examination Regulations for the degree programme.
6. Matrix showing the relationship between the study components and the learning outcomes for each competence area.

Parts 3 and 4 are not included in this document. For the descriptions of the study components, see the Appendix to the Teaching and Examination Regulations 2022-2023 for the degree programme in Pharmacy. Descriptions of the content of each study component can be found in Ocasys, the online course catalogue (http://www.rug.nl/ocasys).

1. Objective(s) of the degree programme

The objective of the Pharmacy bachelor programme is to educate students to become pharmaceutically oriented life scientists. The programme provides students with knowledge, skills and insight in the field of pharmacy and natural sciences (biology, chemistry, physics and mathematics) and optimally prepares them for a subsequent master's degree. Two majors are distinguished in the programme: Pharmacy and Medical Pharmaceutical Sciences.

The Pharmacy bachelor's degree provides an excellent starting position for a subsequent study to become a basic pharmacist (Pharmacy master programme), as well as for a study focusing on scientific research (e.g., the Medical Pharmaceutical Sciences master programme).

2. Learning outcomes of the BSc Pharmacy programme according to the 2016 Pharmacy Competency Framework (Raamplan Farmacie 2016).

A. Knowledge and understanding
Students who successfully complete a Bachelor of Pharmacy degree possess knowledge and understanding of:
1. The structural and physiological properties of cells and tissues and the links between the two.
2. The pathophysiological processes that underlie diseases and the relevant basic anatomy and physiology.
3. The binding sites of active pharmaceutical ingredients in the body, down to a molecular level.
4. The processes and factors that a play role in the route of administration and biological action of medicines and the pharmacon released in the body.
5. The chemical and physicochemical properties and analysis of low and high-molecular-weight active pharmaceutical ingredients and auxiliary pharmaceutical substances.
6. The compounding of medicines in appropriate pharmaceutical dosage forms and the associated quality criteria.
7. How the physicochemical properties of chemical compounds affect their potential use as medicine.
8. The (background to the) medicinal treatment of a number of common health conditions.
9. Desirable and undesirable effects of medicines in the biological system.
10. The main patient characteristics and product properties that may influence the effects of medicines and the diagnostic measurement methods used to assess them.
11. The links between genetic information and the associated phenotype and nongenetic factors that affect this phenotype.
12. The processes involved in the development of medicines.
13. The set-up, measurement methods and (statistical) data processing methods used in pharmaceutical research.
14. The pharmacy as an organisation and the pharmacist’s role in healthcare.
15. Basic health psychology.

B. Skills
Students who successfully complete a Bachelor of Pharmacy degree:
1. Are able to apply qualitative, quantitative and statistical techniques in pharmaceutical research.
2. Are able to define a specific pharmaceutical research question, develop hypotheses and articulate explanations.
3. Knowhow to find relevant pharmaceutical and related medical information and perform qualitative and quantitative analysis.
4. Have demonstrated, in a graduation project, the ability to apply the knowledge, understanding and skills they have acquired to resolve pharmaceutical issues using the empirical cycle.
5. Possess knowledge and understanding of the context of pharmaceutical science, which encompasses philosophical, historical, ethical and/or social perspectives.
6. Are able to read, understand and critically assess pharmaceutical and biomedical professional literature, perform a review of the literature and critically assess relevant publications.
7. Are able to evaluate the quality of pharmaceutical and biomedical information they find.
8. Are aware of the principles of fundamental and applied scientific research.
9. Are able to form an opinion on pharmaceutical issues, based partly on a consideration of relevant societal, clinical, scientific and ethical aspects.
10. Are able to relate pharmaceutical issues to adjacent disciplines (such as medical, social and behavioural sciences, psychology, biology, chemistry and physics).
11. Are able to integrate their knowledge of the different subdomains of pharmacy in dealing with specific pharmaceutical issues.
12. Are able to communicate effectively and efficiently in Dutch and English, both verbally and in writing, tailoring their language to the target group.
13. Are able to adequately report, both verbally and in writing, on scientifically and socially relevant matters that pertain to pharmacy.
14. Are able to make an essential contribution to a scientific discussion.
15. Are able to form, and defend, well-reasoned opinions.
16. Are able to perform, and work independently on scientifically and socially relevant issues that pertain to pharmacy, as part of a team.
17. Are able to apply basic communication skills when conversing with (actors posing as) patients.

C. Professional behaviour
Students who successfully complete a Bachelor of Pharmacy degree:
1. Are able to independently conduct a targeted search for knowledge to deepen their understanding of pharmaceutical issues that are new to them.
2. Are able to think and act at an academic level, and are willing and able to keep developing their professional expertise. They have developed sufficient academic intellectual and professional proficiency to be able to embark on a master program that follows on from the bachelor program.
3. Know how to keep up with, and apply their knowledge of, developments relevant to the profession.
4. Are able to adopt a multidisciplinary approach and identify connections between different disciplines.
5. Are able to reflect on their own development and academic career and make informed decisions regarding appropriate next steps.
6. Are able to reflect on their actions and give, receive and implement (peer) feedback.
7. Demonstrate professional behaviour in pharmacy practice, when acting as an educator, and when performing research relevant to professional practice.
8. Understand the social significance of pharmacy and the associated responsibilities of pharmaceutical and pharmacy professionals.
9. Are aware of the career opportunities open to pharmaceutical and pharmacy professionals.

3. and 5. **Overview of course units, examiners and modes of assessment**

Propaedeutical phase bachelor Pharmacy					**Modes of assessment and frequency: MC = Multiple Choice Test; AST = Assignment; PR = Practical; P = Presentation; WE = Written Exam; R = Report**							
Course unit	**Course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	MC	WE	PR	R	P	AST	**Pr**
Professionalism in Pharmacy 1	WBFA061-03	5	B. van Basten	H.J. Woerdenbag	AST, PR, P			**1**		**1**	**1**	x
Molecular Biology of the Cell 1	WBFA006-04	4	G.J. Poelarends	S. Schmidt	MC, PR	**1**		**1**				x
Molecular Biology of the Cell 2	WBFA007-04	4	G.J. Poelarends	M. Borghesan	MC, PR	**1**		**1**				x
Genetics	WBFA004-03	3	M. Borghesan	R.H. Cool	MC, PR	**1**		**1**				x
The Cell, a Practical Approach	WBFA010-03	3	G.J. Poelarends	R.H. Cool	PR, R			**1**	**1**			x
Mathematics and Statistics	WBFA054-05	5	T.K. Gebretekle	W.P. Krijnen	WE		**1**					
Pharmaceutical Technology and Biopharmacy 1	WBFA017-05	5	H.J. Woerdenbag	H.W. Frijlink	MC	**1**						
Physiology and Pharmacology	WBFA020-05	5	M. Schmidt	R. Gosens	MC, WE, PR	**1**		**1**				x
Molecules and Reactivity	WBFA055-05	5	J. Broos	F.J. Dekker	WE		**1**					
Human Physiology	WBFA022-03	3	B. Buwalda	B.J. Riedstra	MC, PR, R	**1**		**1**	**1**	**1**		x
Pathology	WBFA024-05	5	K. Poelstra	B.N. Melgert	MC, PR, R	**1**		**1**	**1**			x
Pharmaceutical Analysis A	WBFA035-05	5	E.M.J. Verpoorte	P. de Haan	WE, PR, R		**1**	**1**	**1**			x
Receptor Pharmacology	WBFA036-05	5	R. Gosens	A.M. Dolga	R	**1**	**1**					
Global Health and Pharmacotherapy	WBFA034-05	3	K. Taxis	K. van Apeldoorn	AST, WE		**1**				**1**	

Due to remarks in course evaluations of Mathematics and Statistics over the past few years, we are still trying to constitute a solid team of teachers that will be responsible for the teaching of mathematics and (bio)statistics in our programme for the next few years.

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Assessment plan Bachelor Pharmacy 2022-2023

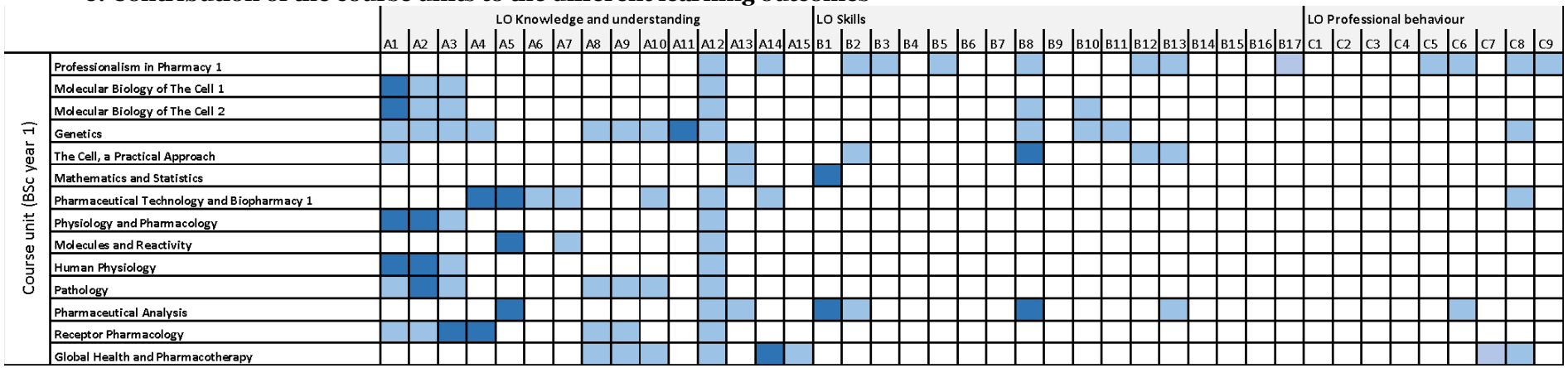
Year 2 bachelor Pharmacy					**Modes of assessment and frequency: MC = Multiple Choice Test; AST = Assignment; PR = Practical; P = Presentation; WE = Written Exam; R = Report**							
Course unit	**Course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	MC	WE	PR	R	P	AST	**Pr**
Professionalism in Pharmacy 2	WBFA062-04	4	B. van Basten	H.J. Woerdenbag	AST, PR, P, R			1	1	1	1	x
Instrumental Analysis	WBFA005-06	6	E.M.J. Verpoorte	P. de Haan	MC+WE, PR, R	1	1	1	1			x
Biostatistics	WBFA011-05	5	P.L. Horvatovich	S. de Vos	WE		1					
Organic en Biosynthesis	WBFA008-05	5	K. Haslinger	F.J. Dekker	WE		1					
Pharmacokinetics	WBFA018-05	5	P.H.C. Åberg	M. Bahlog	WE, IT, PR, R	1	1	1	1			x
Metabolism and Toxicology	WBFA016-05	5	I.A.M. de Graaf	A.P. Nagelkerke	WE, IT, PR, R	1	1	1	1			x
Pharmaceutical Microbiology	WBFA025-05	5	R.H. Cool	P. Olinga	MC+WE, PR, R	1	1	1	1			x
Pharmaceutical Technology and Biopharmacy 2 *	WBFA026-05	5	H.J. Woerdenbag	M.R. Visser	WE, PR		1	1				x
Collected Medicine Groups **	WBFA037-05	5	H.A. Baarsma	M. Schmidt	MC+WE	1	**1**					
Pharmacoepidemiology	WBFA028-05	5	E. Hak	C.C.M. Schuiling-Veninga	MC+WE	1	1					
Immunopharmacology	WBFA015-05	5	B.N. Melgert	n.n.b.	MC	1						
Medicinal Group: Central Nervous System *	WBFA033-05	5	A.M. Dolga	A.S.S. Dömling	WE		1					
Organic Chemistry Practical **	WBFA056-05	5	N. N.H.M. Eisink	A.J. Minnaard	PR, R			1	1			x
Bioanalysis	WBFA032-05	5	P.L. Horvatovich	P.H.M. Le	MC+WE, PR, R	1	1	1	1			x
(*course unit is mandatory for Pharmacy, elective for MPS **course unit is elective for MPS)												

Year 3 mandatory courses bachelor Pharmacy					**Modes of assessment and frequency: MC = Multiple Choice Test; AST = Assignment; PR = Practical; P = Presentation; WE = Written Exam; R = Report**							
Course unit	**Course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	MC	WE	PR	R	P	AST	**Pr**
MG: Endocrine System and Digestive and Respiratory Tract*	**WBFA039-05**	5	R. Gosens	H.A. Baarsma	MC+WE	1	1					
Medicinal Chemistry and Biophysics*	**WBFA038-05**	5	M.R. Groves	A.S.S. Domling	WE		1					
MG: Circulatory Tract*	**WBFA040-05**	5	H.A. Baarsma	M. Schmidt	MC+WE	1	1					
Pharmacology practical*	**WBFA019-05**	5	R. Gosens	H.A. Baarsma	PR, R			1	1			x
Organic Chemistry Practical*	**WBCH014-05**	5	N.N.H.M. Eisink	A.J. Minnaard	PR, R			1	1			x
MG: Infectious diseases and Oncology*	**WBFA041-05**	5	K. Haslinger	A.S.S. Domling	MC	1						
Bachelor Research Project	**WBFA902-14**	14	tekenbevoegde docenten	tekenbevoegde docenten	PR, R, P			1	1	1		x
Professionalism in Pharmacy 3	WBFA063-01	1	B. van Basten	H.J.Woerdenbag	PR, AST			1			1	x
(*course unit is optional course unit in the free minor for MPS)												

Electives bachelor Pharmacy (15 ECTS)													
Course unit	**Course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	MC	WE	PR	R	P	AST	**Pr**
(A) Innovative Patient Care in Pharmacy	**WBFA046-05**	5	C.E.M.J. van Dijk	C.C.M. Schuiling-Veninga	R, P				1	1		
(A) From clinical trials to big data research	**WBFA050-05**	5	E. Hak	S. de Vos	WE, AST		1				1	
(A) Pharmacoeconomics	**WBFA047-05**	5	T.L. Feenstra	E. Hak	WE		1					
(B) Advanced Bioanalysis	**WBFA043-05**	5	P.L. Horvatovich	H. Permentier	MC+WE, PR, R	1	1	1	1			x
(B) Proteins for Biopharmaceuticals & Drug Discovery	**WBFA044-10**	10	S. Schmidt	M.R. Groves	WE, R, P, AST		1	1	1	1	1	x
(C) Pharmacology of Chronic Diseases and Ageing	**WBFA048-05**	5	H.A. Baarsma	A.M. Dolga	R, P				1	1		
(C) Advanced Human Disease Model Technologies	**WBFA051-05**	5	A.M. Dolga	M. Schmidt	MC, P	1				1		
(C) A patient case; from symptoms to treatment, with special focus on diagnostic procedures	**WBFA052-05**	5	D.A.J. Dijck-Brouwer	A.C. Muller Kobold	P, AST					1	1	
(C/D) Herbal Medicine	**WBFA058-05**	5	H.J. Woerdenbag	K. Haslinger	MC, R, AST	1			1		1	
(D) Drug Toxicology and Translational Technology	**WBFA049-05**	5	P. Olinga	A.P. Nagelkerke	WE, R, P, AST		1		1	1	1	
(D) Pharmaceutical Techn. and Biopharm. 3	WBFA059-05	5	W.L.J. Hinrichs	H.W. Frijlink	WE, AST		1				1	
(D) Intro. to Nanomed. and Drug Targeting	WBFA060-05	5	K. Poelstra	A. Salvati	WE, AST		1				1	

The coloured blocks indicate vacancies or uncertainties at this time point (July, 2022).
As back-up for capacity problems in the elective `A patient case`, we will organise the course unit Herbal Medicine again in parallel.

6. Contribution of the course units to the different learning outcomes



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Course (BSc year 2)

	LO Knowledge and understanding															LO Skills																LO Professional behaviour								
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	C1	C2	C3	C4	C5	C6	C7	C8	C9
Instrumental Analysis																																									
Academic Research and Communication Skills 2																																									
Organic en Biosynthesis																																									
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Bioanalysis																																									

(*course unit is mandatory for Pharmacy, elective for MPS **course unit is elective for MPS)

Course (BSc year 3)

	LO Knowledge and understanding															LO Skills																LO Professional behaviour								
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	C1	C2	C3	C4	C5	C6	C7	C8	C9
MG: Endocrine System and Digestive and Respiratory Tract*																																									
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MG: Circulatory Tract*																																									
Pharmacology practical*																																									
Organic Chemistry Practical*																																									
MG: Infectious diseases and Oncology*																																									
Bachelor Research Project																																									
Professionalism in Pharmacy 3																																									
Electives (15 ECTS package A, B, C or D)																																									

Remarks:

In the Curriculum Committee the formerly missing learning outcomes B17 and C7 were discussed. The final report of this discussion was recently sent to the Programme Board Pharmacy. These learning outcomes are now attributed to a number of courses and their focus and content have been adjusted to meet these learning outcomes.

In the meantime it is being discussed with the stakeholders (KNMP, universities) that some learning outcomes as described in Raamplan 2016 are too explicit for the bachelor level and should be adapted in a next version of the Raamplan (*e.g.* learning outcomes B17 and C7). We will however touch upon these learning outcomes in the courses mentioned. It will be a starting point for further training into the direction of these learning outcomes in the master Farmacie. Currently, beginning has been made to update and adapt the Raamplan. Representatives from Groningen will be part of the working group to fulfill this task.