faculty science		pharmacy

Assessment Plan
Bachelor Pharmacy
2023-2024

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 2023-2024. 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 catalog. 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**

Year 1 Bachelor					**Modes of assessment and frequency:** **MC=Multiple Choice Test; AST=Assignment; PR=Practical; P=Presentation;** **WE=Written Exam; R=Report; IT=Interim Test**							
Course unit	**course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	**MC**	**WE**	**PR**	**R**	**P**	**AST**	**IT**
Professionalism in Pharmacy 1	WBFA061-03	3	B. van Basten	K. Taxis	P, AST, PR			1		1	1	
Molecular Biology of the Cell 1	WBFA006-04	4	G.J. Poelarends	S. Schmidt	MC	1						
Molecular Biology of the Cell 2	WBFA007-04	4	G.J. Poelarends	A.P. Nagelkerke	MC	1						
Genetics	WBFA004-03	3	G.J. Poelarends	R.H. Cool	MC	1						
The Cell, a Practical Approach	WBFA010003	3	G.J. Poelarends	R.H. Cool	PR, R			1	1			
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	A.J.W. Scheurink	MC, PR	1		1				
Human Physiology#	WBFA022-03	3	C.M. Drion	A.J.W. Scheurink	MC, PR	1		1				
Molecules and Reactivity	WBFA055-05	5	J. Broos	F.J. Dekker	WE		1					
Pathology	WBFA024-05	5	K. Poelstra	B.N. Melgert	MC, AST	1					1	
Global Health and Pharmacotherapy	WBFA034-05	5	K. Taxis	K.P.A. van Apeldoorn	MC, P, AST	1				1	1	
Pharmaceutical Analysis	WBFA035-05	5	E.M.J. Verpoorte	P. de Haan	WE,PR, R		1	1	1			
Receptor Pharmacology^	WBFA036-05	5	R. Gosens	A. Dolga								
# no new CUAO form available												
^ no mode of assessment known, used to be MC & WE (22/23)												

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.

Year 2 Bachelor					Modes of assessment and frequency: MC=Multiple Choice Test; AST=Assignment; PR=Practical; P=Presentation; WE=Written Exam; R=Report; IT=Interim Test							
Course unit	**course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	**MC**	**WE**	**PR**	**R**	**P**	**AST**	**IT**
Professionalism in Pharmacy 2	WBFA062-04	4	B. van Basten	K. Taxis	R, P, AST				1	1	1	
Instrumental Analysis	WBFA005-06	6	E.M.J. Verpoorte	P. de Haan	WE, PR, R		1	1	1			
Organic and Biosynthesis	WBFA008-05	5	K. Haslinger	F.J. Dekker	WE		1					
Biostatistics	WBFA011-05	5	P.L. Horvatovich	S. de Vos	WE		1					
Metabolism and Toxicology	WBFA016-05	5	I.A.M. de Graaf	A.P. Nagelkerke	MC, WE, PR, R, P	1	1	1	1	1		
Pharmacokinetics	WBFA018-05	5	M. Balogh	P.H.C. Aberg	WE, PR & R		1	1	1			
Pharmaceutical Microbiology (the VMT-test is a mandatory part of the course)#	WBFA025-05	5	P. Olinga	R.H. Cool	MC, WE, PR	1	1	1				
Pharmacoepidemiology	WBFA028-05	5	E. Hak	S. de Vos	MC, WE	1	1					
Bioanalysis	WBFA032-05	5	P.L. Horvatovich	G. Lageveen-Kammeijer	WE, PR		1	1				
Immunopharmacology	WBFA015-05	5	B.N. Melgert	M. Schmidt	MC, AST, IT	1					1	1
Collected Medicine Groups	WBFA037-05	5	H.A. Baarsma	M. Schmidt	MC, WE	1	1					
Pharmaceutical Technology and Biopharmacy 2	WBFA026-05	5	W.L.J. Hinrichs	H.J. Woerdenbag	WE, PR		1	1				
Medicines Group: Drugs for the Central Nervous System	WBFA033-0	5	A.M. Dolga	M. Balogh	MC, WE	1	1					
Organic Chemistry Practical	WBFA056-05	5	A.J. Minnaard	N.N.H.M. Eissink	WE, PR, R		1	1	1			

no new CUAO form available

Year 3 Bachelor					Modes of assessment and frequency: MC=Multiple Choice Test; AST=Assignment; PR=Practical; P=Presentation; WE=Written Exam; R=Report; IT=Interim Test; OE=Oral Exam								
Course unit	**course code**	**ECTS**	**Examiner 1**	**Examiner 2**	**T**	**MC**	**WE**	**PR**	**R**	**P**	**AST**	**OE**	**IT**
Professionalism in Pharmacy 3	WBFA063-01	1	B. van Basten	K. Taxis	AST						1		
Bachelor Research Project	WBFA902-14	14	M. Balogh	lijst van examinatoren	PR, R, P			1	1	1			
From Clinical Trials to Big Data Research	WBFA050-05	5	F. Klont	E. Hak	WE, R, P, AST		1		1	1	1		
Introduction to PharmacoEconomics	WBFA047-05	5	T.L. Feenstra	C.C.M. Schuiling-Veninga	WE, P, AST, IT		1		1		1		1
Patient Perspectives in Pharmacy	WBFA046-05	5	C.E.M.J. van Dijk	K. Taxis	R, P, AST				1	1	1		
Advanced Bioanalysis	WBFA043-05	5	P.L. Horvatovich	H. Permentier	WE, P		1			1			
Proteins for Biopharmaceutical & Drug Discovery	WBFA044-10	10	S. Schmidt	W. Quax	WE, P, AST		1			1	1		
Advanced Human Disease Model Technologies	WBFA051-05	5	A.M. Dolga	R. Gosens	MC, P, AST	1				1	1		
Pharmacology of Chronic Diseases and Ageing	WBFA048-05	5	H.A. Baarsma	M. Schmidt	R, P, AST				1	1	1		
Pharmaceutical Technology and Biopharma 3	WBFA059-05	5	W.L.J. Hinrichs	H.W. Frijlink	MC	1							
Introduction to Nanomedicine and Drug Targeting	WBFA060-05	5	K. Poelstra	A. Salvati	MC, WE, AST	1	1			1			
Drug Toxicology and Translational Technology	WBFA049-05	5	A.P. Nagelkerke	I.A.M. de Graaf	WE, P, AST		1			1	1		
Herbal Medicine	WBFA058-05	5	H.J. Woerdenbag	K. Haslinger	MC	1							
Thermodynamica	WBFA021-05	5	W.L.J. Hinrichs	H.W. Frijlink	MC, WE	1	1						
Pharmacology Practical	WBFA019-05	5	H.A. Baarsma	R. Gosens	PR, R, OE			1	1			1	
Medicinal Chemistry and Biophysics	WBFA038-05	5	M.R. Groves	F.J. Dekker	WE		1						
MG: Endocrine System and Digestive and Respiratory Tract#	WBFA039-05	5	R. Gosens	M. Schmidt	MC, WE	1	1						
MG: Circulatory Tract	WBFA040-05	5	H.A. Baarsma	M. Schmidt	MC, WE	1	1						
MG: Infectious Diseases and Oncology	WBFA041-05	5	M. Balogh	K. Haslinger	MC	1							
Organic Chemistry Practical	WBFA056-05	5	N.N.H.M. Eisink	A.J. Minnaard	WE, PR, R		1	1	1				

no new CUAO form available

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

Course unit (BSc year 1)

	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
Professionalism in Pharmacy 1																																								
Molecular Biology of The Cell 1																																								
Molecular Biology of The Cell 2																																								
Genetics																																								
The Cell, a Practical Approach																																								
Mathematics and Statistics																																								
Pharmaceutical Technology and Biopharmacy 1																																								
Physiology and Pharmacology																																								
Molecules and Reactivity																																								
Human Physiology																																								
Pathology																																								
Pharmaceutical Analysis																																								
Receptor Pharmacology																																								
Global Health and Pharmacotherapy																																								

light small contribution
dark big contribution

Course unit (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
Professionalism in Pharmacy 2																																								
Instrumental Analysis																																								
Organic and Biosynthesis																																								
Biostatistics																																								
Metabolism and Toxicology																																								
Pharmacokinetics																																								
Pharmaceutical Microbiology (de VMT-toets is verplicht onderdeel van dit vak)																																								
Pharmacoepidemiology																																								
Bioanalysis																																								
Immunopharmacology																																								
Collected Medicine Groups																																								
Pharmaceutical Technology and Biopharmacy 2																																								
Medicines Group: Drugs for the Central Nervous System																																								
Organic Chemistry Practical																																								

light small contribution
dark big contribution

Lijst met examinatoren voor bachelorprojecten

Name	Initials	Department	Aspirant
Åberg	P. H. C.	Pharmaceutical Analysis	
Baarsma	H.A.	Lecturers Team	
Balogh	M.	Pharmaceutical Analysis	
Berg, van den	J.H.M.	Pathology & Medical Biology - Pathology	
Bock, de	G.H.	Epidemiology	
Boven, van	J.F.M.	Clinical Pharmacy & Pharmacology	
Burgess	J.K.	Pathology and Medical Biology	

Daemen	C.A.H.H.	Medical Microbiology - Molecular Virology	
Deelman	L.	Clinical pharmacy & pharmacology	
Dekker	F.J.	Chemical and Pharmaceutical Biology	
Denig	P.	Clinical pharmacy & pharmacology	
Dolga	A.M.	Molecular Pharmacology	
El Aidy	S.	Molecular Immunology & Microbiology	
Faber	K.N.	Gastrointestinal and liver diseases	
Feenstra	T.L.	PharmacoTherapy, -Epidemiology and -Economics	
Fodran	P.	Chemical and Pharmaceutical Biology	Yes
Frijlink	H.W.	Pharmaceutical Technology and Biopharmacy	
Gosens	R.	Molecular Pharmacology	
Graaf, de	I.A.M.	Pharmacokinetics, Toxicology and Targeting	
Groves	M.R.	Drug Design	

Hak	E.	PharmacoTherapy, -Epidemiology and -Economics	
Haslinger	K.	Chemical and Pharmaceutical Biology	
Heeringa	P.	Pathology & Medical Biology - Medical Biology	
Heijink	H.I.	Pathology & Medical Biology - Medical Biology	
Henning	R.H.	Clinical pharmacy & pharmacology	
Hinrichs	W.L.J.	Pharmaceutical Technology and Biopharmacy	
Horvatovich	P.L.	Analytical Biochemistry	
Huckriede	A.L.W.	Medical Microbiology - Molecular Virology	
Ijzendoorn, van	S.C.D.	Biomed. Sciences of Cells and Systems - Membrane Cell Biology	
Jansman	F.G.A.	PharmacoTherapy, -Epidemiology and -Economics	
Janssen	D.B.	Biotechnology	
Kampinga	H.H.	Biomed. Sciences of Cells and Systems	
Kamps	J.A.A.M.	Pathology & Medical Biology - Medical Biology	

Klont	F.	PharmacoTherapy, -Epidemiology and -Economics	Yes
Kosterink	J.G.W.	Clinical Pharmacy and Pharmacology / FE2	
Lageveen-Kammeijer	G.S.M.	Analytical Biochemistry	Yes
Lambers-Heerspink	H.J.	Clinical pharmacy & pharmacology	
Melgert	B.N.	Molecular Pharmacology	
Mol	P.G.M.	Drug Regulatory Science	
Molema	G.	Pathology & Medical Biology - Medical Biology	
Moshage	A.J.	Gastrointestinal and liver diseases	
Nagelkerke	A.P.	Pharmaceutical Analysis	
Olinga	P.	Pharmaceutical Technology and Biopharmacy	
Poelarends	G.J.	Chemical and Pharmaceutical Biology	
Poelstra	K.	Pharmacokinetics, Toxicology and Targeting	
Puijenbroek, van	E.P.	PharmacoTherapy, -Epidemiology and -Economics	

Quax	W.J.	Chemical and Pharmaceutical Biology	
Salvati	A.	Pharmacokinetics, Toxicology and Targeting	
Scheurink	A.J.W.	Endocrinology and Metabolism / Neurobiology	
Schmidt	M.	Molecular Pharmacology	
Schmidt	S.	Chemical and Pharmaceutical Biology	Yes
Schuiling-Veninga	C.C.M.	PharmacoTherapy, -Epidemiology and -Economics	
Taxis	K.	PharmacoTherapy, -Epidemiology and -Economics	
Touw	D.J.	Clinical Pharmacy and Pharmacology	
Verpoorte	E.M.J.	Pharmaceutical Analysis	
Vos, de	S.	PharmacoTherapy, -Epidemiology and -Economics	
Woerdenbag	H.J.	Pharmaceutical Technology and Biopharmacy	
Zuhorn	I.S.	Biomedical Engineering	