

Assessment plan for the curriculum of the Bachelor's degree programme Biology in 2022-2023

Introduction

This Assessment Plan is a systematic description of the way of examination and assessment of all study components in the bachelor degree programme Biology. It is based on the assessment policy of the Faculty of Science and Engineering (FSE), as set out in the 2016-2017 version of the FSE Quality Assurance Manual (Chapter 6: Assessment policy) and the protocol setting out the duties and powers of the Faculty's Board of Examiners (Manual for Board of Examiners 2017-2018, Chapter 4: Duties of the Board of Examiners).

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

1. Objective(s) of the degree programmes
2. The learning outcomes of the degree programmes
3. Descriptions of the study components, as set out in the appendices to the Teaching and Examination Regulations 2022-2023 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. An overview of the coordinators and the assessment mode for each study component. This overview is based on the curriculum approved by the Programme Committee, as set out in the appendices to the Teaching and Examination Regulations 2022-2023 for the degree programme.
6. A matrix showing the relationship between the study components and the learning outcomes for the degree programme.

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 Biology. Descriptions of the content of each study component can be found in Ocasys, the online course catalogue (<http://www.rug.nl/ocasys/>).

Objectives of the degree programmes

The bachelor degree programme Biology enables the graduates to acquire scientific skills and knowledge as entry to responsible societal positions and stimulate a life-long learning attitude. The ultimate goal of the programme is to educate the graduates as autonomous, critical and responsible academics in the field of Life Sciences.

1. BSc Biology

1.1. Learning outcomes of the degree programme BSc. Biology

Graduates are able to:

1. Explain general basic principles of biology and describe how they relate to each other;
2. Estimate the relevance of research results in one or more areas of biology published in academic journals and discuss these results with peers;
3. Describe fundamental and/or applied scientific research and recognize areas of interest within it;
4. Describe the relationship between various disciplines and integrate terms and concepts from the subject areas;
5. Recognise and analyse scientific problems, and design a scientific/academic approach to them in a systematic manner.
6. Under supervision, formulate a research hypothesis or propose a research design within their own discipline, and possess sufficient practical skills to conduct the research themselves;
7. Explain the societal relevance of the discipline, evaluate the related responsibilities and judge their individual role in that context.
8. Develop a work method independently and proactively, justify it, and carry it out in order to achieve a specific aim;
9. Contribute to and take responsibility for solving a specific problem or task in a specific role as part of a team;
10. Report about research in a structured manner, both orally and in writing;

The degree programme also offers the student:

11. To explore career opportunities and opportunities for follow-on degree programmes.

1.2. Overview of examiners and assessment modes of the study components – BSc. Biology

Course Title	1st Examiner	2nd Examiner	WE	MC	OE	IT	R	P	PR	AST
Basic Cell and Molecular Biology	Linskens, M.H.K.	Scheffers, D.J.		x						
Behavioural Biology	Riedstra, B.J.	t.b.d.	x	x		x				
Behavioural Neurosciences	Havekes, R.	Zee, E.A. van der		x			x			
Big Data in Human Disease	Kurilshchikov, A.M.	Yang-Fu, J.					x	x		x
Big Data Management in Ecology and Evolution	Benthem, K.J. van	t.b.d.						x		x
Bioanalytical and Omics Techniques	Thunnissen, A.M.W.H.	Kuipers, O.P.	x					x		
Biochemistry and Cell Biology in Ecology and Evolution	Thunnissen, A.M.W.H.	Driessen, A.J.M.	x							
Bioinformatics	Jong, A. de	Incarnato, D.							x	x
Biology & Society: Ethical and Professional Aspects	Zevenberg, J.	Grooters, S.	x	x			x	x		x
Biology of Cancer	Jong, S. de	Kruyt, F.A.E.		x				x		
Biology of Human Behaviour	t.b.d.	t.b.d.	x						x	
Biomedical Research Laboratory Course	t.b.d.	t.b.d.					x		x	x
Bio-organic Chemistry	Minnaard, A.J.	Reintjes, N.R.M.	x							
Biostatistics 1	Verhulst, S.	Milias Argeitis, A.	x						x	
Biostatistics 2	Benthem, K.J. van	Pen, I.R.	x							
Biotechnology	Fraaije, M.W.	Fürst, M.J.L.J.	x	x						
C++ for Biologists	Doorn, G.S. van	Bakker, J.				x			x	
Cardiovascular Disease	Krenning, G.	Kamps, J.A.A.M.		x						x
Cell Biology and Immunology	Linskens, M.H.K.	Heeringa, P.		x						x
Cell Biology and Microscopy	Klei, I.J. van der	Roos, W.H.	x	x						
Cell Migration and Communication	Linskens, M.H.K.	Billerbeck, S.K.	x	x						
Chronobiology	Hut, R.A.	Meerlo, P.		x			x	x		x
Competences and Professionalization in Biology	Rijssel, M. van	Zevenberg, J.					x	x		
Conservation Biology	Eriksson, B.D.H.K.	Oloff, H.	x				x		x	x
Ecological and Evolutionary Modelling	Doorn, G.S. van	t.b.d.								
Ecophysiology of Plants and Animals	t.b.d.	Dietz, M.W.	x			x	x		x	x

Course Title	1st Examiner	2nd Examiner	WE	MC	OE	IT	R	P	PR	AST
Endocrinology	Faas, M.M.	Vos, P. de		x						x
Enzymology and Thermodynamics	Slotboom, D.J.	Maglia, G	x							
Epigenetics and Gene-editing	Rots, M.G.	Foijer, F.		x						x
Evolution and Development	Elliot, M.G.	Billeter, J.C.	x	x				x	x	
Evolutionary and Ecological Genomics	Lequime, S.	Falcao Salles, J.F.	x							x
Evolutionary Ecology	Verhulst, S.	Pen, I.R.	x						x	
Evolutionary Medicine	Vos, M.G.J. de	Elliot, M.G.	x	x				x		
Evolutionary Processes	Beukeboom, L.W.	Etienne, R.S.	x							x
First year symposium	Linskens, M.H.K.	Kortholt, A.						x		
Food and Metabolism	Kruit, J.K.	Jonker, J.W.		x			x	x		
Genes and Behaviour	Billeter, J.C.	Eisel, U.L.M.	x					x	x	
Genes and Evolution	Wertheim, B.	Geuverink, E.	x							x
Genetics, Ecology and Evolution	Beukeboom, L.W.	Komdeur, J.	x	x						x
Hematopoietic stem cells: development, differentiation and disease	Boom, V. van den	Schuringa, J.J.	x	x				x	x	x
Host-Microbe Interactions	El Aidy, S.	Harmsen, H.J.M.	x	x			x			
Human Genetics and Genomics	Westers, H.	Diemen, C.C. van	x	x				x	x	x
Immunology	Bogaart, G. van den	Nawijn, M.		x						
Immunology and Disease	Laman, J.	Heeringa, P.		x					x	x
Integrative Biology	t.b.d.	t.b.d.	x				x	x		
Integrative Neuroscience	Dijk, G.J. van	Zee, E.A. van der		x		x	x		x	
Lab course	Kiel, J.A.K.W.	Geuverink, E.		x			x		x	
Marine Biology	Meij, S. van der	Boer, M.K. de	x					x		
Medical Cell Biology	Mauthe, M.	Baron, W.	x					x		
Medical Physiology	Duinen, H. van	Otter-Drost, T.A.	x	x					x	
Medical Structural Biology	Guskov, A.	Thunissen, A.M.	x	x						x
Metabolism	Heinemann, M.	Bakker, B.	x	x						
Microbes and Infection	Huckriede, A.L.W.	Harmsen, H.J.M.		x			x		x	

Course Title	1st Examiner	2nd Examiner	WE	MC	OE	IT	R	P	PR	AST
Microbiology	Poolman, B.	Driessen, A.J.M.	x	x		x				
Microbiome	Falcao Salles, J.	Vos, M.J. de						x		x
Modelling Life	Doorn, G.S. van	Milias Argeitis, A.	x			x				x
Molecular Genetics	Incarinato, D.	Alvarez-Sieiro, P.	x	x						
Molecular Research in Human Disease	Koonen, D.P.Y.	Sluis, A.J.A. van de					x	x		x
Molecules of Life	Mayer, C.	Witte, M.D.	x							
Neurobiology of Ageing	Zee, E.A. van der	Jorna, L.M.		x					x	
Physiology	Buwalda, B.	Scheurink, A.J.W.		x					x	
Practical Carrousel	Billerbeck, S.K.	Fraaije, M.W.	x						x	x
Programming for Life Sciences	Marrink, S.J.	Wassenaar, T.A.				x				x
Psychobiology	Meerlo, P.	Scheurink, A.J.W.	x	x			x	x		
Research Project Biomedical Sciences	Rybczynska, A.A.	Appointed examiner					x	x	x	
Research Project Behaviour & Neurosciences	Jorna, L.M.	Appointed examiner					x	x	x	
Research Project Ecology and Evolution 1	Geuverink, E.	Appointed examiner					x	x	x	
Research Project Ecology and Evolution 2	Tiedge, K.	Appointed examiner					x	x	x	
Research Project Integrative Biology 1	Geuverink, E.	Appointed examiner					x	x	x	
Research Project Integrative Biology 2	Geuverink, E.	Appointed examiner					x	x	x	
Research Project Molecular Life Sciences	Alvarez Sieiro, P.	Appointed examiner					x	x	x	
Research Skills in Ecology and Evolution 1	Geuverink, E.	Smit, C.							x	x
Research Skills in Ecology and Evolution 2	Smit, C.	Geuverink, E.	x	x			x	x	x	
Research Skills in Ecology and Evolution 3	Geuverink, E.	Smit, C.								
Research Skills in Life Sciences 1	Scheffers, D.J.	Drion, C.		x				x	x	
Research Skills in Life Sciences 2	Bianchi, F.	Kortholt, A.		x				x	x	
Research Skills in Life Sciences 3	Scheffers, D.J.	Drion, C.		x				x	x	
Systems Ecology & Ecological Interactions 1	Elzenga, J.T.M.	Both, C.	x						x	
Systems Ecology & Ecological Interactions 2	Both, C.	Elzenga, J.T.M.	x						x	

This table shows all the study components for each year of the programme, the intended coordinator, the relationship with the learning outcomes and the assessment modes. This satisfies requirement 3 in the Protocol of Duties and Powers of the Board of Examiners of the Faculty of Science and Engineering:

Before the academic year commences, the Board of Examiners determines the examiners responsible for carrying out testing and assessment in the degree programme.

The abbreviations for the relevant teaching methods are explained in the legend of the table. Examples of assessment modes include:

- *Written exam with open questions (WE)*
- *Written exam with multiple-choice questions (MC)*
- *Oral exam (OE)*
- *Interim indicator test (IT)*
- *Report (R)*
- *Presentation (P)*
- *Assessment of practical assignment (PR)*
- *Assessment of (homework) assignments (AST)*

1.3. Relation between study components and further specification of the learning outcomes BSc. Biology

- X the course is essential and sufficient to realise one of the programme-level learning outcomes.
x the course makes an important contribution to a programme-level learning outcome (along with other courses that make complementary contributions).
. the course makes a minor contribution to a programme-level learning outcome.

Course Title	E.1	E.2	E.3	E.4	E.5	E.6	E.7	E.8	E.9	E.10	E.11
Basic Cell and Molecular Biology	x	.	.	x	.	.	.	.	.	.	.
Behavioural Biology	x	x	x	.	.	.	.	.	.	.	.
Behavioural Neurosciences	x	X	.	X	.	.	x	.	.	.	X
Big Data in Human Disease	x	x	x	x	x	x	.	x	x	x	.
Big Data Management in Ecology and Evolution	.	x	x	x	x	.	x	x	.	x	.
Bioanalytical and Omics Techniques	x	X	x	x	x	.	.	.	x	x	.
Biochemistry and Cell Biology in Ecology and Evolution	x	x	.	X	.	.	x	.	.	.	x
Bioinformatics	x	.	.	.	x	.	.	x	X	x	.
Biology & Society: Ethical and Professional Aspects	.	x	.	x	.	x	X	.	X	x	X
Biology of Cancer	x	x	x	x	x	.	x	.	X	x	.
Biology of Human Behaviour	x	X	.	.	.	x	.	.	.	x	.
Biomedical Research Laboratory Course	.	x	.	x	x	X	.	.	X	X	.
Bio-organic Chemistry	x	x	x	x	.	.	.	.	.	.	.
Biostatistics 1	x	x	.	.	x	x	.	x	x	.	x
Biostatistics 2	.	X	.	.	x	x	.	x	.	.	.
Biotechnology	x	x	X	X	.	.	x	.	x	.	x
C++ for Biologists	.	.	.	x	x	.	.	x	x	x	x
Cardiovascular Disease	x	X	x	x	x	.	.	.	X	x	.
Cell Biology and Immunology	x	.	.	x	.	.	.	.	.	.	.
Cell Biology and Microscopy	x	x	.	x	.	.	x	.	.	.	x
Cell Migration and Communication	x	x	.	.	.	.	.	.	.	.	.
Chronobiology	x	X	.	.	x	x	.	x	x	x	x
Competences and Professionalization in Biology	.	x	x	x	.	.	x	.	x	x	x
Conservation Biology	x	x	x	x	.	.	x	.	.	.	X
Ecological and Evolutionary Modelling											
Ecophysiology of Plants and Animals	x	X	x	X	.	.	x	.	.	.	x

Course Title	E.1	E.2	E.3	E.4	E.5	E.6	E.7	E.8	E.9	E.10	E.11
Endocrinology	x	x	x	.	.	.	.	.	x	x	.
Enzymology and Thermodynamics	x	.	.	x	.	.	.	.	.	.	.
Epigenetics and Gene-editing	x	.	x	.	.	.	.	.	x	.	.
Evolution and Development	x	X	x	X	.	.	x	.	.	.	x
Evolutionary and Ecological Genomics	x	X	x	X	.	.	x	.	.	.	x
Evolutionary Ecology	x	X	x	X	.	.	x	.	.	.	X
Evolutionary Medicine	x	x	x	X	.	.	.	.	x	x	.
Evolutionary Processes	x	x	x	x	x	.	x	.	.	.	x
First year symposium	.	x	.	.	.	.	.	.	x	x	.
Food and Metabolism	x	x	x	X	x	.	x	x	x	x	.
Genes and Behaviour	x	.	.	X	x	x	x	x	x	x	.
Genes and Evolution	x	.	x	x	.	.	.	.	.	x	.
Genetics, Ecology and Evolution	x	x	x	X	x	.	x	.	.	.	x
Hematopoietic stem cells: development, differentiation and disease	x	x	x	x	x	.	x	.	x	x	.
Host-Microbe Interactions	x	.	x	x	x	.	x	x	.	x	.
Human Genetics and Genomics	x	x	x	x	x	.	x	.	.	.	x
Immunology	x	.	x	.	.	.	x	.	.	.	.
Immunology and Disease	x	x	x	x	x	.	x	.	X	x	.
Integrative Biology	x	x	x	X	.	.	.	.	x	x	.
Integrative Neuroscience	x	.	.	x	.	.	.	.	x	x	.
Lab course	x	.	.	x	x	.	.	x	.	x	x
Marine Biology	x	.	.	x	.	.	x	.	x	.	x
Medical Cell Biology	x	X	x	x	x	.	.	.	.	x	x
Medical Physiology	x	.	.	X	.	.	.	.	x	.	.
Medical Structural Biology	x	.	x	x	x	.	.	x	.	.	.
Metabolism	x	.	x	.	.	.	.	.	.	.	.
Microbes and Infection	x	.	x	x	x	.	x	.	X	x	.
Microbiology	x	x	x	x	x	.	x	.	.	.	.
Microbiome	x	X	x	x	x	.	x	.	.	.	x
Modelling Life	x	.	x	x	x	.	.	.	x	x	.
Molecular Genetics	x	x	x	x	x	.	x	.	.	.	.
Molecular Research in Human Disease	x	X	x	.	x	x	.	x	X	x	.

Course Title	E.1	E.2	E.3	E.4	E.5	E.6	E.7	E.8	E.9	E.10	E.11
Molecules of Life	x	.	x	x	x	.	x	x	.	.	.
Neurobiology of Ageing	x	x	x	x	.	.	x	.	.	.	x
Physiology	x	.	x	x	.	.	x	.	.	.	.
Practical Carrousel	.	.	.	.	.	x	.	x	x	.	.
Programming for Life Sciences	.	x	.	x	x	x	x	x	x	x	x
Psychobiology	x	X	x	x	x	x	x	.	x	.	.
Research Project Biomedical Sciences	.	x	x	.	X	X	.	X	X	X	x
Research Project Behaviour & Neurosciences	.	x	x	.	X	X	.	X	x	X	.
Research Project Ecology and Evolution 1	.	x	x	.	X	X	.	X	X	X	x
Research Project Ecology and Evolution 2	.	x	x	.	X	X	.	X	X	X	.
Research Project Integrative Biology 1	.	x	x	.	X	X	.	X	X	X	x
Research Project Integrative Biology 2	.	x	x	.	X	X	.	X	X	X	x
Research Project Molecular Life Sciences	.	x	x	.	X	X	.	X	x	X	.
Research Skills in Ecology and Evolution 1	.	x	.	.	.	.	.	.	.	x	.
Research Skills in Ecology and Evolution 2	.	x	.	x	.	x	.	x	x	x	.
Research Skills in Ecology and Evolution 3	.	.	.	x	.	x	.	x	x	x	.
Research Skills in Life Sciences 1	x	X	x	.	x	x	.	.	.	x	.
Research Skills in Life Sciences 2	x	X	x	.	x	x	.	.	.	x	.
Research Skills in Life Sciences 3	x	X	x	.	x	x	.	.	.	x	.
Systems Ecology & Ecological Interactions 1	x	x	x	X	.	.	.	.	.	.	x
Systems Ecology & Ecological Interactions 2	x	x	x	X	.	.	.	.	.	.	x

This table establishes the relationship between the (specified) learning outcomes and all study components of the curriculum.