Assessment plan for the curriculum of the **Bachelor's** degree programme in Life Science & Technology, 2024-2025

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Date approval Faculty Board:

1. Vision on assessment

- The goal of the bachelor programme Life Science & Technology is to provide students with a broad, multidisciplinary base which lets them specialize in their chosen field in year 3. To prepare LST students for all possible specializations, it is essential the LST students follow practical courses in different STEM disciplines and are exposed to laboratory practices and methods of assessment in the different STEM disciplines.
- Mathematical knowledge is necessary in each of the STEM disciplines LST students can specialize in. To ensure that students retain and build their knowledge in mathematical skills a learning line throughout the programme with physics/mathematics courses, and regular assessment of these skills, is required.
- Assessment in the LST programme should use different forms – written exams, oral presentations and writing assignments – to prepare students to communicate in an academic manner both orally and in writing.
- In order to give LST students feedback on their performance during the course, midterms and homework assignments (formative assessment) should form an important part of assessment within LST.

2. Assessment guidelines

Please explain the general assessment procedures that are used in the programmes. For example, 4-eyes principle in test design, standardized grading forms, rubrics.

Given the multidisciplinary nature of LST, and the fact that all teachers in LST teach in other BSc programmes (often more than one), we do not want to draft a specific set of assessment guidelines for LST – this would create confusion for teachers who would need to check for every specific course to which specific set of guidelines they need to adhere – something we think will not be done in practice. Rather, we trust that by following the assessment guidelines of the disciplinary programmes that our teachers also teach in, and through the monitoring of assessment by the Board of Examiners, the overall quality of assessment is safeguarded.

3. Learning outcomes of the degree programme

Learning outcomes for the degree programme, further specified learning outcomes (where relevant) and/or specified for tracks within the degree programme. Please add extra rows if necessary.

	Learning Outcome *At the end of the programme, the graduate is able to…*
1	Explain general basic principles of biology from chemical and physical perspectives
2	Explain the basic principles of applied technology within the field of life sciences
3	Estimate the relevance of research results in Science, Technology, Engineering and Mathematics (STEM) published in academic journals and discuss these results with peers
4	Describe fundamental and/or applied scientific research and/or a technological method and recognize areas of interest within it
5	Describe the relationship between various disciplines and integrate terms and concepts from the subject areas
6	Recognise and analyse scientific problems, and design a scientific/academic approach to address them in a systematic manner
7	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
8	Explain the societal relevance of the discipline, evaluate the related responsibilities and judge their individual role in that context
9	Develop a work method independently and proactively, justify it, and carry it out in order to achieve a specific aim
10	Contribute to and take responsibility for solving a specific problem or task in a specific role as part of a team
11	Report about research in a structured manner, both orally and in writing

Through the mentorate, the degree programme also offers the graduate the ability to explore career opportunities and opportunities for follow-on degree programmes.

4. Overview of assessment methods, test moments for course units, and examiners

Year 1

Period	**Course**	**EC**	**Assessment methods**	**Does (part of the) assessment have a formative function?**	**Test moment(s)** (e.g. mid-term, continuous assessment, exam week, etc)	**First examiner**	**Second examiner**
1A	Mammalian Cell Biology	5	WE, MC, Ast	No	Exam week Assessment via assignments	G. van den Bogaart	R. Vlijm
1A	Optics	5	WE, MC	Yes	Exam week	M.H. Diniz Guimaraes	M.S. Pchenitchnikov
1A	Practical Course Optics and Cell Biology	5	R, PR	No	Continuous feedback during practicals	A. U. Zielinska	M. Fontana
1B	Biochemistry for LST	5	WE, MC, Ast	Yes	Exam week Assessment via assignments	A. Kortholt	D.J. Scheffers
1B	Calculus for LST	5	WE	Yes	Exam week	W.R. Browne	A.H. de Vries
1B	Organic Chemistry for Life Science 1	5	WE, OR, Ast	No	Exam week Oral exam halfway through the course Assessment via assignments	A.J. Minnaard	S. Harutyunyan

2A	Principles of Physiology	5	MC, R, P, PR	Yes	Exam week Feedback during practicals Presentation towards the end of the course	G. van Dijk	C. Drion
2A	Programming for Life Sciences	5	IT, Ast	Yes	Continuous feedback during computer practicals Assessment via assignments	K.M. Tych	S.J. Marrink
2A	Thermodynamics	5	WE	No	Exam week	A.H. de Vries	S.J. Marrink
2B	Pharmaceutical Analysis A	5	WE, R, Ast	Yes	Exam week Continuous feedback during practicals Assessment via assignments	E.M.J. Verpoorte	J.W. Meints
2B	Biophysics	5	WE, Ast	Yes	Exam week Assessment via assignments	W.H. Roos	R. Vlijm
2B	Scientific Reading and Communication Skills	5	Ast	Yes	Assessment via assignments	A.M.W.H. Thunnissen	A. Guskov

The abbreviations for the relevant teaching methods are explained in the legend of the table.

Year 2

Period	Course	EC	Assessment methods	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. mid-term, continuous assessment, exam week, etc)	First examiner	Second examiner
1A	Applied Microbiology	5	MC, WE	Yes	Exam week	S.K. Billerbeck	A.J.M. Driessen
1A	Linear Algebra for LST	5	WE, IT, Ast	Yes	Exam week Midterm	P. Kilicer	P. Lamprou
1A	Practical Course Microbiology	5	MC, R, P, PR	Yes	Continuous feedback during practicals	J.L. Kamenz	S.K. Billerbeck
1B	Bioinorganic Chemistry	5	WE	Yes	Exam week	J.E.M.N. Klein	E. Otten
1B	Quantum and Classical Mechanics for LST	5	WE, Ast	Yes	Exam week Assessment via assignments	C.H. van der Wal	J.L. Slawinska
1B	Spectroscopic Tools for the Life Sciences	5	WE, IT, Ast	Yes	Exam week Midterm Assessment via assignments	R.M. Hildner	P.C.A. van der Wel
2A	Imaging	5	WE, MC, R	No	Exam week	P.C.A. van der Wel	R.M. Hildner
2A	Organic Chemistry for Life Science 2	5	WE, Ast	Yes	Exam week Assessment via assignments	M.T.C. Walvoort	A.J. Minnaard
2A	Practical Skills in Organic Chemistry for LST	5	PR, R, Ast	Yes	Continuous feedback during practicals	N.N.H.M. Eisink	M.D. Witte

Period	Course	EC	Assessment methods	Does (part of the) assessment have a formative function?	Test moment(s) (e.g. mid-term, continuous assessment, exam week, etc)	First examiner	Second examiner
2B	Applied Biotechnology	5	WE, P	Yes	Exam week Presentation towards the end of the course	S. Schmidt	K. Haslinger
2B	Genetics and Evolution	5	WE, MC, Ast, PR, P	Yes	Exam week Assessment via assignments	K.J. Tiedge	S.J.J. Lequime
2B	LST and Society: Ethical and Professional Aspects	5	WE, MC, R, P	No	Exam halfway through the course Presentation towards the end of the course	S. Grooters	J. Zevenberg

Examples of assessment methods include:

- *Written Exam (WE)*
- *Multiple Choice (MC)*
- *Oral Exam (OR)*
- *Report (R)*
- *Presentation (P)*
- *Practical Work (PR)*
- *Assignment (Ast)*

Year 3

Due to the set-up of the LST-programme, the third year is when LST-students have to follow courses they need in order to gain access to the Master degree programme they wish to continue with.

The TER-appendix of LST 2023/2024 contains several packages of courses that can be used for access to the master programmes of:

- Biology
- Biomedical Engineering
- Biomolecular Sciences
- Chemistry
- Medical Pharmaceutical Sciences
- Physics

The admission requirements for each master programme are listed in the TER-appendix of those master programmes.Examiners and assessment methods of those courses are listed in the assessment plans of those programmes.

The bachelor research project is an essential part of fulfilling the entry requirements for a Master degree programme. An LST-student who wishes to gain access to a Master degree programme has to do a bachelor research project in the field of that master.

In practice, this means doing a bachelor research project within the Bachelor degree programme that Master degree programme is linked with.

Course unit name	ECTS	Examiner(s) / course coordinator	Mode of assessment
Bachelor Research Project	15	Examiners from the relevant/corresponding bachelor programmes of our faculty	R, P, PR (in accordance with the assessment plan of the respective Bachelor programmes)

Relationship between course units and details of the learning outcomes

Please note in the table below the course units per block in the programme. Indicate which learning outcomes are assessed in which courses by adding an X in the relevant cell. Please add extra rows if necessary.
An X means that the learning outcome is explicitly assessed (not merely addressed) in the course.

		Learning outcomes of the degree programme										
		1	2	3	4	5	6	7	8	9	10	11
Period	**Course**	**Year 1 –compulsory courses**										
1A	Mammalian Cell Biology	x	x	x	x	x	x					x
1A	Optics		x		x	x						
1A	Practical Course Optics and Cell Biology	x	x		x		x	x		x	x	x
1B	Biochemistry for LST	x	x									
1B	Calculus for LST		x		x	x	x		x	x		
1B	Organic Chemistry for Life Science 1	x			x	x	x					
2A	Biophysics	x	x	x	x	x	x					x
2A	Principles of Physiology	x				x	x	x	x		x	x
2A	Thermodynamics	x	x		x		x					
2B	Pharmaceutical Analysis A	x	x				x	x			x	x
2B	Programming for Life Sciences				x		x	x		x	x	x
2B	Scientific Reading and Communication Skills	x	x	x	x	x	x				x	x

		Learning outcomes of the degree programme										
		1	2	3	4	5	6	7	8	9	10	11
Period	**Course**	**Year 2 compulsory courses**										
1A	Applied Microbiology	x	x	x					x			
1A	Bioinorganic Chemistry	x	x		x	x	x					
1A	Practical Microbiology	x	x		x		x	x		x	x	x
1B	Linear Algebra		x	x		x						
1B	Quantum and Classical Mechanics	x	x		x	x	x			x	0	x
1B	Spectroscopic Tools for Life Sciences		x		x		x					
2A	Organic Chemistry for Life Science 2	x				x	x					
2A	Practical Skills in Organic Chemistry		x		x		x	x				x
2A	Imaging		x	x	x	x						
2B	Applied Biotechnology	x	x	x	x	x			x			
2B	LST and Society: Ethical and Professional Aspects			x		x	x	x	x	x	x	x
2B	Genetics and Evolution	x	x		x	x			x			
Period	**Course**	**Year 3 compulsory courses**										
	Bachelor project	x	x	x	x	x	x	x	x	x	x	x

Appendix I - Examiners for Life Science & Technology

This alphabetical overview of all LST examiners is mainly for administrative purposes and to show changes per academic year.

- A.K. Biegun
- K. van der Bij
- S.K. Billerbeck
- G. van den Bogaart
- W.R. Browne
- G. van Dijk
- M.H. Diniz Guimaraes
- A.J.M. Driessen
- C. Drion
- N.N.H.M. Eisink
- M. Fontana
- M.J.L.J. Fürst
- S. Grooters
- A. Guskov
- S. Harutyunyan
- K. Haslinger
- R.M. Hildner
- J.L. Kamenz
- P. Kilicer
- J.E.M.N. Klein
- A. Kortholt
- P. Lamprou
- S.J.J. Lequime
- S.J. Marrink
- A.J. Minnaard
- E. Otten
- M.S. Pchenitchnikov
- W.H. Roos
- D.J. Scheffers
- S. Schmidt
- J.L. Slawinska
- A.M.W.H. Thunnissen
- K.J. Tiedge
- K.M. Tych
- E.M.J. Verpoorte
- R. Vlijm
- A.H. de Vries
- C.H. van der Wal
- M.T.C. Walvoort
- P.C.A. van der Wel
- M.D. Witte
- J. Zevenberg
- A. U. Zielinska

The degree programme has proposed that the following teachers become examiners for Life Science & Technology and is awaiting the decision from the Board of Examiners:

- N/A