

**Appendix:  
Programme Specifics  
BSc Programme Nanobiology**

**2022-2023**

As referred to in Article 7.4 of the Teaching and Examination Regulation  
(TER)

Faculty of Medicine (Erasmus MC)  
Erasmus University Rotterdam

and

Faculty of Applied Sciences  
Delft University of Technology

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## Paragraph 1 Appendix to the TER

### TER Article 3 Admission to Bachelor's degree programme Nanobiology Specific

The requirements for admission to the BSc programme Nanobiology are described in Article 3 of the Teaching and Examination Regulation Nanobiology (TER 2022-2023). Applicants complete their application in Studielink, then complete a supplemental questionnaire and a selection examination. Each step must be completed on time in order to proceed to the next step.

## Paragraph 2 Structure Overview

### Article 1 Division of the Academic Year

The academic year of the programme is divided in two semesters. Each semester consists of 2 periods (quarters). Each quarter consists of two octals.

### Article 2 Programme Divisions

The BSc programme Nanobiology is a three year BSc programme, the study load is described in TER Article 7.1. The minor is scheduled in the first semester of the third year (see article 5b).

## Paragraph 3 Composition of the Programme

The courses and learning goals are described below. Information about contact hours, education period and exam format can be found in the study guide.

### Article 3. First Year

Course	Code	EC	Assessment method	Attainments (see Art 5 TER)						
				1	2	3	4	5	6	7
Analysis 1	NB1201	5	written exam	X	X					
Analysis 2	NB1206	5	written exam	X	X					
Analysis 3	NB1211	3	written exam	X	X					
Biochemistry	NB1012	3	homework, written exam	X	X					
Biomolecular Programming	NB1120	3	project and oral exam	X	X		X			
Biophysics	NB1132	3	report, written exam	X	X	X				
Chemistry 1	NB1102	3	homework, written exam	X	X					
Chemistry 2	NB1110	3	homework, written exam	X	X					
Genetics	NB1022	4	participation, written exams	X	X	X				X
Introduction to Studying Nanobiology	NB1031	3	writing assignments, peer evaluations, group project	X	X			X	X	X
Journal Club 1	NB1052	3	group presentation, peer feedback			X		X	X	X
Labcourse Nanobiology A1*	NB1150	3	lab journal, practicals, written exam	X			X	X	X	
Labcourse Nanobiology A2*	NB1151	3	lab journal, practicals, written exam	X	X	X	X	X	X	X
Labcourse Nanobiology B1*	NB1163	3	lab journal, practicals, written exam	X			X	X	X	
Labcourse Nanobiology B2*	NB1164	3	lab journal, practicals, written exam	X	X	X	X	X	X	X
Linear Algebra	NB1230	3	quizzes, final exam	X		X		X		

				<b>Attainments (see Art 5 TER)</b>						
Molecular Biology	NB1016	3	written exam	X		X				
Physical Biology of the Cell 1	NB1072	3	practicals, written exam	X	X	X	X		X	X
Physics 1a	NB1140	4	quizzes, written exams	X	X					
Physics 1b	NB1143	3	homework, written exam	X	X					

\*Students take either labcourse series A part 1 and 2 or Labcourse series B part 1 and 2. They are assigned into a particular series by the programme. Students will be informed of how distribution between the two tracts will be done before the start of the course.

There is a compensation rule for Analysis in the Nanobiology programme. If the grades for Analysis 1, 2, and 3 are all at least 5, and the weighted (by EC) average of these grades equals at least 5.8 after rounding to decimals, then the student gets the EC for all three courses.

All courses are required unless alternatives are approved by the Board of Examiners.

#### Article 4 Second Year

<b>Course</b>	<b>Code</b>	<b>EC</b>	<b>Assessment method(s)</b>	<b>Attainments (see Art 5 TER)</b>						
				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Bioinformatics	NB2161	4.5	Project, practicals, written exam	X	X	X		X	X	X
Biomolecular Structure and Function	NB2230	3	homework, practicals, written exam	X	X	X	X			X
Computational Science	NB2181	3	Project with oral exam, written exam	X	X	X		X		X
Differential equations	NB2061	3	written exams	X		X				
Electronic Instrumentation	NB2214	6	report, practicals, written exams	X	X		X	X		X
Evolutionary & Developmental Biology	NB2032	6	Poster presentation, written exams	X	X	X		X		X
Image Analysis	NB2121	3	written exam	X	X	X	X			
Journal Club 2	NB2151	1	presentation	X	X	X		X	X	X
Microscopy/Nanoscopy practice	NB2046	1.5	practicals, written report, oral exam	X			X			
Nanotechnology	NB2081	2	report, written exam		X	X		X		X
Optics & Microscopy	NB2041	3	written exam	X	X	X				
Philosophy and Ethics	NB2022	3	presentation, written assignments					X	X	
Physical Biology of the Cell 2	NB2072	3	practicals, written exam	X	X					X
Physics 2	NB2141	3	written exams	X	X	X		X*		
Signals and Systems	TN2545	6	written exam	X	X					
Statistical Physics	NB2220	3	homework, written exam	X						
Statistics	NB2171	3	written exam	X		X				X
Thermodynamics and Transport	NB2011	3	written exams	X						

All courses are required unless alternatives are approved by the Board of Examiners.

## Article 5 Third Year

Course	Code	Required	EC	Attainments (see Art 5 TER)						
				1	2	3	4	5	6	7
BachelorEnd Project (BEP)	NB3000	Yes	20	X	X	X	X	X	X	X
Nanomedicine*	NB3011		2.5	X	X	X		X		X
Computational Neuroscience	NB3014		2.5	X	X	X				
A Primer in Neuroscience	NB3015		2.5	X	X			X		
High-Speed Scientific Computing	NB3016		2.5	X	X					
Quantum Mechanics in Nanobiology 1	NB3017		2.5	X	X					
Quantum Mechanics in Nanobiology 2**	NB3018		2.5	X	X					
Molecular Motors	NB3019		2.5	X	X	X				
Genomics Technology in Breast Cancer Research*	NB3020		2.5	X	X	X		X		X
Optics and its application in Nanobiology	NB3021		2.5	X	X					
Epigenetics	NB3022		2.5	X		X		X		X
Human Complex Genetics	NB3023		2.5	X	X	X		X	X	X
Advanced Math Topics	NB3024		2.5	X	X			X		
Writing A BEP in English	TBM301A		2.5					X		
Independent Research***	NB3030		Var	X	X			X		X

\*These courses are limited enrolment courses and require preregistration. See Study Guide for detailed information on how to register.

\*\*NB3018 requires taking NB3017 or permission of the teacher.

\*\*\*Starting an independent project must be discussed with the program director and approved prior to beginning the project. The programme may begin a project and open enrollment to any students at any time.

### Article 5.a Bachelor's End Project

Admission requirements for a student to register for the Bachelor's end project (BEP): first year completed (= 60 EC) plus at least 60 EC from 2<sup>nd</sup> and 3<sup>rd</sup> year combined.

Students are responsible for finding a supervisor for their project. Their supervisor must be an approved Nanobiology programme supervisor, the list of approved supervisors is called the "GreenList". The project is evaluated by the supervisor and a second independent evaluator. The GreenList also identifies those who teach in the nanobiology BSc programme. Both the supervisor and second examiner must be on the Green List, and one must teach in the Nanobiology BSc programme. Information and forms on the Bachelor's end project, and the Green List be found in Brightspace: "Eindprojecten Administratie TNW / Thesis Office Applied Sciences".

### Article 5.b Minor and Minors Abroad

Nanobiology students may choose any available minor offered by TU Delft, or Leiden University of 30 EC. Erasmus University minors are also permitted, but they are 15 EC and must be combined with something else as a free minor. Students may also choose a minor at a different Dutch university, or a free minor, these options will need approval by the Board of Examiners.

Students wishing to do a a minor outside of the Netherlands (exchange minor) need to have passed all first year courses (=60 EC) and all courses of the first semester of year 2 no later than April 9 before their minor. If students are still missing one course of Q3 or Q4 from year 1, this must be discussed with the study advisor and permission may be given. If students are missing more than one course from year 1, they are not eligible to do an exchange minor.

## Paragraph 4 Honours Programme

### Article 6 Admission to the Honours programme

Requirements: weighted average grade  $\geq 8.0$ , first year completed (= 60 EC). All Nanobiology students who meet these requirements at the end of their first year are welcome to apply to the Nanobiology Honours programme. Students will be selected by the Honours Programme coordinator and the Nanobiology programme director on the basis of academic record, study plan and a motivation statement from the student

### Article 6.a Composition of the Honours Programme

Students complete 20 EC of Honours Programme specific coursework. This includes 13-15 EC within the Nanobiology Honours programme and 5-7 EC in the institution wide component of the Bachelor's Honours programme for a total of 20EC. Detailed description of programme options are available in the study guide.

Course	Code	EC
Honours programme Seminars	NB2901HPB	2
Honours programme Journal Club	NB2902HPB	4
Honours programme Project	NB2903HPB	5-7
Honours programme Broaden-your-experience-project	NB2904HPB	2

## Paragraph 5 Exams

### Article 9 Required Attendance at Practical Work

Many courses have a practical component. Students may be required to complete certain work in order to participate in the examination. Exam participation requirements are specified in the studyguide.

Some courses have mandatory safety tests which students must pass before they can begin the practicals.

### Article 10 Form of the Exam and the Assessment Strategy

The form of the exams and the assessment strategy is described for each course in the studyguide.

Examiners may specify different exam formats for the resits.

Attendance requirements are specified for each course in the studyguide.

Rules on the composition of the final course grade can be found in the programme specific the "Rules and Regulations of the Board of Examiners"

### Article 11 Schedule for Resits

Timing for resits is included in each courses' information in the study guide. Precise details of date and time are available in the TU Delft TimeTable. In general, resits are scheduled 5-8 weeks after the exam.

## Paragraph 5 Degree Audit

### Article 12 Transition Regulations

The following transition regulations apply depending on when a student began their programme.

#### Article 12.a Transition Regulation Academic Year 2014-2015

NB2022: Philosophy and Ethics is a merger of NB2021 and NB2051 from the academic year 2013-2014. Students that need to retake both can follow the course NB2022.

**Article 12.b Transition Regulation Academic Year 2015-2016**

Programme 2014-2015			Programme 2015-2016		
Code	Course name	EC	Code	Course name	EC
WI1411NB	Analysis 1	5	WI1415NB	Analysis 1	5
WI1422NB	Analysis 2	5	WI1423NB	Analysis 2	5
WI1413NB	Analysis 3	3	WI1416NB	Analysis 3	3
NB1142	Physics 1a	3	NB1140	Physics 1a	4
NB1062	Labcourse Nanobiology	3	NB1062	Labcourse Nanobiology part 1	3
NB1066	Labcourse Nanobiology	3	NB1066	Labcourse Nanobiology part 2	3
NB1071	Physical Biology of the cell	3	NB1072	Physical Biology of the cell	3
NB1131	Biophysics	3	NB1132	Biophysics	3
NB1042	Faculty seminar	1		Faculty seminar will not continue	
NB2211	Electronic instrumentation	6	NB2211-14	Electronic instrumentation	6
NB2031	Evolutionary Developmental Biology part 1 and 2	6	NB2032	Evolutionary Developmental Biology part 1 and 2	6
WI3104TN	Statistics	3	NB2171	Statistics	3
	New course also accessible for students from before cohort 2013		NB3020	Current topics in Nanobiology: Genomics and Proteomics Technology in Breast Cancer Research	2.5

NB1140: Physics 1a: students from cohort 2014 or before will receive 4 EC for retake of Physics 1a

**Article 12.c Transition Regulation Academic Year 2016-2017**

Programme 2015-2016			Programme 2016-2017		
Code	Course name	EC	Code	Course name	EC
NB1016	Biomolecular Dynamics	3	NB1016	Molecular Biology	3

**Article 12.d Transition Regulation Academic Year 2017-2018**

n.a.

**Article 12.e Transition Regulation Academic Year 2018-2019**

n.a.

**Article 12.f Transition Regulation Academic Year 2019-2020**

Programme 2018-2019			Programme 2019-2020		
Code	Course name	EC	Code	Course name	EC
NB1012	Biomolecular Dynamics	3	NB1012	Biochemistry	3
NB2061	Differential Equations	3	NB2191	Differential Equations	3

**Article 12.g Transition Regulation Academic Year 2020-2021**

The following courses have new names or new numbers. It has no effect on the content of the programme. The new courses fulfill the previous requirements.

Programme 2019-2020			Programme 2020-2021		
Code	Course name	EC	Code	Course name	EC
NB2151	Journal Club	1	NB2151	Journal Club 2	1
TN2624NB	Statistical Physics	3	NB2220	Statistical Physics	3
TN2513	Computation/MatLab	3	NB2181	Computational Science	3
NB2071	Physical Biology of the Cell	3	NB2071	Physical Biology of the Cell 2	3
NB3011	Current topics in Nanobiology: Nanomedicine	2.5	NB3011	Nanomedicine	2.5

Programme 2019-2020			Programme 2020-2021		
NB3012	Current topics in Nanobiology: Protein structure, theory & tools	2.5	NB3012	Protein structure, theory & tools	2.5
NB3014	Current topics in Nanobiology: A primer in Neural Networks	2.5	NB3014	Computational Neuroscience	2.5
NB3015	Current topics in Nanobiology: Systems Neurobiology	2.5	NB3015	A Primer in Neuroscience	2.5
NB3016	Current topics in Nanobiology: A primer on High-Speed Scientific Simulations	2.5	NB3016	A primer on High-Speed Scientific Simulations	2.5
NB3017	Quantum mechanics in Nanobiology - 1	2.5	NB3017	Quantum mechanics in Nanobiology 1	2.5
NB3018	Quantum mechanics in Nanobiology - 2	2.5	NB3018	Quantum mechanics in Nanobiology 2	2.5
NB3019	Current topics in Nanobiology: Molecular Motors	2.5	NB3019	Molecular Motors	2.5
NB3020	Current topics in Nanobiology: Genomics and Proteomics Technology in Breast Cancer Research	2.5	NB3020	Genomics Technology in Breast Cancer Research	2.5
NB3021	Current topics in Nanobiology: Optics and its applications in Nanobiology	2.5	NB3021	Optics and its applications in Nanobiology	2.5
NB3022	Current topics in Nanobiology: Epigenetics	2.5	NB3022	Epigenetics	2.5

#### Article 12.h Transition Regulation Academic Year 2021-2022

NB1062 and NB1066 Labcourse 1 and 2 will be replaced by Labcourse A parts 1 and 2 or Labcourse B parts 1 and 2 (course codes NB1150, NB1151, NB1163, NB1164). Students from prior cohorts who did not complete NB1062 and/or NB1066 will need to take one or two of the new courses to fulfill their requirements. They will need to discuss with the study advisor which course(s) to take

NB3031 Laboratory Practicum Development is a one time course that will only be offered in 2021-2022. One resit will be available.

Four of the math courses have received new course codes. No other changes, students from previous cohorts can take these courses to fulfill their requirements. All other rules are the same.

Old Code	Course name	EC	New Code	Course name	EC
WI1415NB	Analysis 1	5	NB1200	Analysis 1	5
WI1423NB	Analysis 2	5	NB1205	Analysis 2	5
WI1416NB	Analysis 3	3	NB1210	Analysis 3	3
WI1142NB	Linear Algebra	3	NB1230	Linear Algebra	3

#### Article 12.i Transition Regulation Academic Year 2022-2023

Three of the math courses have received new course codes. No other changes, students from previous cohorts can take these courses to fulfil their requirements. All other rules are the same.



<b>Old Code</b>	<b>Course name</b>	<b>EC</b>	<b>New Code</b>	<b>Course name</b>	<b>EC</b>
NB1200	Analysis 1	5	NB1201	Analysis 1	5
NB1205	Analysis 2	5	NB1206	Analysis 2	5
NB1210	Analysis 3	3	NB1211	Analysis 3	3

NB2211-14 Electronic Instrumentation has a new course code, NB2214. There are no other changes, and students can use either to complete their degree audit.

NB2111 Evolution will no longer be offered, there will be two resit opportunities in 2022-2023. Students from previous cohorts who have not yet completed NB2111, will take the new course NB2230 Biomolecular Structure and Function instead in order to complete this requirement of their degree audit.

Students who have taken NB2111 Evolution may take NB2230 Biomolecular Structures and Function as an elective.

Students may not receive credit for both NB3012 Protein Structure and NB2230 Biomolecular Structures and Function because of course content overlap. This should be discussed with the academic counsellor.

Students from prior cohorts may take any of the currently listed electives as electives.

## **Paragraph 8 Final provisions**

### **Article 13 Entry into Force**

These programme specifics are valid for the academic year 2022-2023 starting on

5 September 2022