Programme-specific Section of the Curriculum for the MSc Programme in Biochemistry at the Faculty of Science, University of Copenhagen

2009 (Rev. 2025)

Contents

1 Title, affiliation and language

A shared section that applies to all BSc, part-time MSc and MSc Programmes at the Faculty of Science is linked to this programme-specific curriculum.

1.1 Title

The MSc Programme in Biochemistry leads to a Master of Science (MSc) in Biochemistry with the Danish title: *Cand.scient. (candidatus/candidata scientiarum) i biokemi*.

1.2 Affiliation

The programme is affiliated with the Study Board for the Biological Area and the students can both elect, and be elected, to this study board.

1.3 Corps of external examiners

The following corps of external examiners is used for the central parts of the MSc Programme:

- Corps of External Examiners for Biology (*biologi*).

1.4 Language

The language of this MSc Programme is English.

2 Academic profile

2.1 Purpose

The MSc Programme in Biochemistry is a research-based programme that aims to provide students with competences, skills and knowledge within one of the biochemistry subject sub-disciplines, with an individually chosen specialisation centred on an independent, experimental research project. The programme provides IT-competences and digital literacy.

2.2 General programme profile

The student follows a profile in biochemistry covering e.g. the sub-disciplines molecular and cell biology, molecular genetics, molecular microbiology, protein science and neurobiology. In addition, the student follows supplementary courses where restricted elective courses are within e.g. molecular and cell biology, molecular genetics, molecular microbiology, protein science and neurobiology. The elective courses can be in other disciplines. Thus, it is possible to create an individual academic profile within biochemistry.

Biochemistry, which combines chemistry and biology in the understanding of life at the molecular level, is the key subject discipline of the programme. The student will be trained to critically understand, analyse and evaluate theoretical and experimental methods in biochemistry and evaluate scientific conclusions within biochemistry. Both from original scientific literature and in relation to their own experiments carried out during the thesis.

2.3 General structure of the programme

The MSc Programme is set at 120 ECTS.

There are no pre-defined specialisations in the programme.

2.4 Career opportunities

The MSc Programme in Biochemistry qualifies students to become professionals within business functions and/or areas such as:

- A PhD programme

- Within biochemistry including biochemistry sub-disciplines, graduates will attain a high level of theoretical and experimental expertise that will qualify them to work independently, be part of a research team and manage projects at universities, biotech and pharmaceutical industry and hospitals.

3 Description of competence profiles

Students following the MSc Programme acquire the knowledge, skills and competences listed below. Students will also acquire other qualifications through elective subject elements and other study activities.

3.1 Competence profile

Graduates holding an MSc in Biochemistry have acquired the following:

Knowledge about:

- Research at a high international level, including an overview of the latest research in Biochemistry and relevant sub-disciplines.
- Industrial and medical applications.
- The latest research and relevant theoretical and experimental methods in Biochemistry and relevant sub-disciplines.

Skills in/to:

- Master relevant theoretical and experimental scientific methods in Biochemistry and relevant sub-disciplines.
- Read and understand original biochemistry literature.
- Document the results of experiments.
- Use the subject's main databases and relevant digital tools within IT technology and artificial intelligence and data management.

Competences in/to:

- Formulate, structure and manage a research project and evaluate it in relation to state-of-the-art research in the field and to sustainability and innovation.
- Develop and apply biochemical methodology to generate new knowledge.
- Generate, evaluate and analyse data quantitatively, including its degree of uncertainty, potential sources of error, the relevance of the methodology used and the validity of the data using relevant digital tools within IT and artificial intelligence.
- Organise own work, both individually and as part of a research group.
- Manage projects in public- and private-sector institutions and companies.
- Critically read and evaluate original biochemical literature including relevant sub-disciplines, identify scientific issues, reflect on the model solutions used and develop alternative solutions.
- Discuss the application of biochemistry research results in social, environmental, sustainability and ethical contexts on the basis of academic arguments.
- Disseminate the results of their own and other people's experiments and complex problems using correct academic terminology, both orally and in writing.
- Take independent responsibility for their own academic development and specialisation.

4 Admission requirements

4.1 Bachelor's degrees that automatically fulfil the academic requirements

Applicants with one of the following Bachelor's degrees automatically fulfil the academic requirements for admission to the MSc Programme in Biochemistry:

- Biochemistry (*biokemi*) from University of Copenhagen (reserved access).
- Molecular Biomedicine (*molekylær biomedicin*) from University of Copenhagen
- Nanoscience (*nanoscience*) from University of Copenhagen
- Biochemistry and Molecular Biology from University of Southern Denmark
- Biotechnology engineering (*civilingeniør*) from Aarhus University.
- Molecular Biology from Aarhus University.
- Molecular Medicine from Aarhus University.

4.2 Other Bachelor's degrees

Applicants with a Bachelor's degree, Professional Bachelor's degree or equivalent from Danish or international universities other than those listed in 4.1 are qualified for admission to the MSc Programme in Biochemistry if the programme includes the following:

- A minimum of 60 ECTS from formal classes within chemistry and biochemistry/molecular biology of which a minimum of 30 ECTS must be in chemistry and 22.5 ECTS in biochemistry/molecular biology.
- In total, the applicant must have a minimum of 30 ECTS that stem from courses with experimental laboratory exercises.

Subject elements in protein chemistry or biophysical chemistry may be counted either as chemistry or biochemistry/molecular biology.

4.3 Other applicants

The Faculty may also admit applicants who, after an individual academic assessment, are assessed to possess educational qualifications equivalent to those required in Subclauses 4.1-2.

4.4 Language requirements

Applicants must be able to document English proficiency corresponding to one of the following:

- upper secondary school degree, bachelor's degree or master's degree in English from Australia, Canada, Ireland, New Zealand, United Kingdom or USA.
- Nordic entrance examination with an English level comparable to the Danish level B or higher
- International Baccalaureate (IB) from an international school
- European Baccalaureate (EB) from one of the approved schools
- English B or A as Single Subject Course in Denmark
- Abiturzeugnis from Germany
- IELTS test score of minimum 6.5
- TOEFL test score of minimum 83
- Cambridge Advanced English (CAE) or Cambridge English: Proficiency (CPE) passed at level C1 or C2

4.5 Supplementary subject elements

The qualifications of an applicant to the MSc programme are assessed exclusively on the basis of the qualifying Bachelor's degree. Supplementary subject elements passed between

the completion of the Bachelor's programme and the admission to the MSc programme cannot be included in the overall assessment.

However, subject elements passed before the completion of the Bachelor's programme may be included in the overall assessment. This includes subject elements completed as continuing education as well as subject elements completed as part of a former higher education programme. A maximum of 30 ECTS supplementary subject elements can be included in the overall assessment.

Subject elements passed before completing the Bachelor's programme which are to form part of the MSc programme to which the student has a legal right of admission (§15-courses) cannot be included in the overall assessment.

5 Prioritisation of applicants

With a Bachelor's degree in Biochemistry from University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Biochemistry if the student applies in time to begin the MSc Programme within three years of the completion of the Bachelor's degree.

If the number of qualified applicants to the programme exceeds the number of places available, applicants will be prioritised according to the following criteria:

- Total number of ECTS in relevant courses*
- Grades in relevant courses*

*Relevant courses include courses in metabolism, enzymology, protein science, cell biology, organic chemistry, physical chemistry and documented laboratory experience.

6 Structure of the programme

The compulsory subject elements, restricted elective subject elements and the thesis constitute the central parts of the programme (Section 30 of the Ministerial Order on Bachelor and Master's Programmes (Candidatus) at Universities).

6.1 Programme components

The programme is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

6.1.1 Compulsory subject elements

All of the following subject elements are to be covered (22.5 ECTS):			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK25000U	Principal Subjects in Biochemical Research	Block 1+2	15 ECTS
NBIK13014U	Major Subject Project	Blocks 1-5	7.5 ECTS

6.1.2 Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK15003U	Advanced Bacteriology 1	Block 1	7.5 ECTS
NBIK15006U	Advanced Cell Biology	Block 1	7.5 ECTS
NBIK15017U	Theoretical Molecular Genetics	Block 1	7.5 ECTS
NBIK22003U	Protein Research Lab – Intrinsically Disordered Proteins	Block 1	7.5 ECTS
NBIA05014U	Structural Bioinformatics	Block 2	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS
NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
NBIK15005U	Advanced Bacteriology 2	Block 2	7.5 ECTS
NBIK15009U	Cellular Signalling in Health and Disease	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK16001U	NMR spectroscopy	Block 2	7.5 ECTS
NBIK17001U	Dynamic Models in Molecular Biology	Block 2	7.5 ECTS
NKEA06015U	Crystallography	Block 2	7.5 ECTS
LBIK10207U	Synthetic Biology	Block 3	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
NBIK15014U	Human Genetics	Block 3	7.5 ECTS
NBIK24002U	Molecular Mechanisms in Metabolic Disease	Block 3	7.5 ECTS
NBIK22004U	Integrative Structural Biology	Block 3+4	15 ECTS
NBIK11009U	Experimental Cell Biology	Block 4	15 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS

6.1.3 Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.1.4 Projects.

6.1.4 Projects

- Projects outside the course scope (PUK) may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice (PIP) may be included in the elective section of the programme with 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects (PREP) may be included in the elective and/or restricted elective section of the programme with up to 7.5 ECTS. PREP may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.
- PUK, PIP and PREP may not exceed 30 ECTS of the programme.

6.1.5 Thesis

The MSc Programme in Biochemistry includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

6.1.6 Academic Mobility

The curriculum makes it possible to follow subject elements outside the Faculty of Science.

The academic mobility for the MSc Programme in Biochemistry is placed in block 3+4 of the 1st year.

Academic mobility requires that the student follows the rules and regulations regarding pre-approval and credit transfer.

In addition, the student has the possibility to arrange similar academic mobility in other parts of the programme.

7 Exemptions

In exceptional circumstances, the study board may grant exemptions from the rules in the curriculum specified solely by the Faculty of Science.

8 Commencement etc.

8.1 Validity

This subject specific section of the curriculum applies to all students enrolled in the programme – see however Appendix 2.

8.2 Transfer

Students enrolled on previous curricula may be transferred to the new one as per the applicable transfer regulations or according to an individual credit transfer by the study board.

8.3 Amendment

The curriculum may be amended once a year so that any changes come into effect at the beginning of the academic year. Amendments must be proposed by the study board and approved by the Dean.

Notification about amendments that tighten the admission requirements for the programme will be published online at www.science.ku.dk one year before they come into effect.

If amendments are made to this curriculum, an interim arrangement may be added if necessary to allow students to complete their MSc Programme according to the amended curriculum.

Appendix 1 The recommended academic progression

The table illustrates the recommended academic progression. The student is allowed to plan an alternative progression within the applicable rules.

Tables for students admitted to the programme in September (summer):

Table – MSc Programme in Biochemistry

<table>
<tr><th>Period</th><th>Block 1</th><th>Block 2</th><th>Block 3</th><th>Block 4</th></tr>
<tr><td rowspan="2">1st year</td><td colspan="2">Principal Subject in Biochemistry</td><td>Restricted elective</td><td>Restricted elective</td></tr>
<tr><td>Elective</td><td>Elective</td><td>Restricted elective</td><td>Major Subject Project</td></tr>
<tr><td>2nd year</td><td colspan="4">Thesis</td></tr>
</table>

Tables for students admitted to the programme in February (winter):

Table – MSc Programme in Biochemistry*

<table>
<tr><th>Period</th><th>Block 3</th><th>Block 4</th><th>Block 1</th><th>Block 2</th></tr>
<tr><td rowspan="2">1st year</td><td>Elective</td><td>Restricted elective</td><td colspan="2">Principal Subject in Biochemistry</td></tr>
<tr><td>Elective</td><td>Restricted elective</td><td>Major Subject Project</td><td>Restricted elective</td></tr>
<tr><td>2nd year</td><td colspan="4">Thesis</td></tr>
</table>

*This table is only relevant for students who begin the MSc Programme in February (block 3).

Appendix 2 Interim arrangements

The Shared Section that applies to all BSc, part-time MSc and MSc Programmes at the Faculty of Science applies to all students.

The interim arrangements below only consist of parts where the current curriculum differs from the rules and regulations that were previously valid. Therefore, if information about relevant rules and regulations are missing, it can be found in the curriculum above.

1 General changes for students admitted in the academic year 2024/25

Students admitted to the MSc Programme in the academic year 2024/25 must finish the programme as listed in the curriculum above with the following exceptions.

The MSc Programme in Biochemistry consists of the following elements:

- Specialisation, 120 ECTS, including the thesis.

The student must choose one of the following specialisations:

- Molecular Cell Biology and Immunology.
- Molecular Genetics.
- Molecular Microbiology.
- Protein Chemistry.

1.1 Molecular Cell Biology and Immunology

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table– Molecular Cell Biology and Immunology

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Cell Biology and Immunology***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Cell Biology and Immunology*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Cell Biology and Immunology***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**

Period	Block 3	Block 4	Block 1	Block 2
2nd year	Thesis			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15006U	Advanced Cell Biology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK15009U	Cellular Signalling in Health and Disease	Block 2	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
SMOK14003U	Chronic Inflammation. From Basic Research to Therapy	Block 3	7.5 ECTS
NBIK20005U	Cellular and Integrative Physiology	Block 3	7.5 ECTS
NBIK24002U	Molecular Mechanisms in Metabolic Disease	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS

Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.1.4 Projects.

Projects

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Cell Biology and Immunology includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

1.2 Molecular Genetics

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Molecular Genetics

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Genetics***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Genetics*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Genetics***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15017U	Theoretical Molecular Genetics	Block 1	7.5 ECTS
NBIK15011U	Experimental Molecular Genetics	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS

NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIK15014U	Human Genetics	Block 3	7.5 ECTS
NBIA09043U	Population Genetics	Block 3	7.5 ECTS
LBIK10207U	Synthetic Biology	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.2.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Genetics includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

1.3 Molecular Microbiology

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Molecular Microbiology

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Microbiology***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**

Period	Block 1	Block 2	Block 3	Block 4
2nd year	Thesis			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Microbiology*

Period	Block 3	Block 4	Block 1	Block 2
1st year	Elective	Restricted elective	*Principal Subject in Molecular Microbiology*	
	Elective	Restricted elective	Major Subject Project	Restricted elective
2nd year	Thesis			

Subject elements in italics have been discontinued. See discontinued courses below.

*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15003U	Advanced Bacteriology 1	Block 1	7.5 ECTS
NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
NBIK15016U	The Human Microbiome	Block 1	7.5 ECTS
NFOK22000U	Microbiological Food Safety and Quality: Control, Cases and Practicals	Block 2	7.5 ECTS
NBIK15005U	Advanced Bacteriology 2	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
NBIK17001U	Dynamic Models in Molecular Biology	Block 2	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
LBIK10136U	Heterologous Expression	Block 3	15 ECTS
NBIK16003U	Marine Microbiology and Virology	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK16000U	The Human Microbiome - Experiments	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
NNEK22001U	Metabolomics	Block 4	7.5 ECTS
	Thesis Preparation Project	Block 1-5	7.5 ECTS

Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.3.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Microbiology includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

1.4 Protein Chemistry

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Protein Chemistry

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Protein Chemistry***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Protein Chemistry*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Protein Chemistry***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**

Period	Block 3	Block 4	Block 1	Block 2
2nd year	Thesis			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK22003U	Protein Research Lab – Intrinsically Disordered Proteins	Block 1	7.5 ECTS
NKEA06015U	Crystallography	Block 2	7.5 ECTS
NBIA05014U	Structural Bioinformatics	Block 2	7.5 ECTS
NBIK16001U	NMR Spectroscopy	Block 2	7.5 ECTS
NFYK14039U	Radioactive Isotopes and Ionizing Radiation	Block 3	7.5 ECTS
NBIK22004U	Integrative Structural Biology	Block 3+4	15 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
	Thesis Preparation Project	Block 1-5	7.5 ECTS
NBIK22002U	Advanced Protein Science 1 – Biophysical Methods	Discontinued*	7.5 ECTS

*See discontinued courses below

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.4.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Protein Chemistry includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

2 General changes for students admitted in the academic year 2023/24

Students admitted to the MSc Programme in the academic year 2023/24 must finish the programme as listed in the curriculum above with the following exceptions.

2.1 Molecular Cell Biology and Immunology

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table– Molecular Cell Biology and Immunology

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Cell Biology and Immunology***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Cell Biology and Immunology*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Cell Biology and Immunology***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15006U	Advanced Cell Biology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK15009U	Cellular Signalling in Health and Disease	Block 2	7.5 ECTS

NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
SMOK14003U	Chronic Inflammation. From Basic Research to Therapy	Block 3	7.5 ECTS
NBIK20005U	Cellular and Integrative Physiology	Block 3	7.5 ECTS
NBIK24002U	Molecular Mechanisms in Metabolic Disease	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS
NBIK23001U	Hot Topics in Physiology – Molecular Mechanisms in Lifestyle-Related Diseases	Discontinued*	7.5 ECTS

*See discontinued courses below

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.1.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Cell Biology and Immunology includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

2.2 Molecular Genetics

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Molecular Genetics

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Genetics***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Genetics*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Genetics***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15017U	Theoretical Molecular Genetics	Block 1	7.5 ECTS
NBIK15011U	Experimental Molecular Genetics	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIK15014U	Human Genetics	Block 3	7.5 ECTS
NBIA09043U	Population Genetics	Block 3	7.5 ECTS
LBIK10207U	Synthetic Biology	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS

Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.

- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.2.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Genetics includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

2.3 Molecular Microbiology

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Molecular Microbiology

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Microbiology***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Microbiology*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Microbiology***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**

Period	Block 3	Block 4	Block 1	Block 2
2nd year	Thesis			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15003U	Advanced Bacteriology 1	Block 1	7.5 ECTS
NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
NBIK15016U	The Human Microbiome	Block 1	7.5 ECTS
NFOK22000U	Microbiological Food Safety and Quality: Control, Cases and Practicals	Block 2	7.5 ECTS
NBIK15005U	Advanced Bacteriology 2	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
NBIK17001U	Dynamic Models in Molecular Biology	Block 2	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
LBIK10136U	Heterologous Expression	Block 3	15 ECTS
NBIK16003U	Marine Microbiology and Virology	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK16000U	The Human Microbiome - Experiments	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
NNEK22001U	Metabolomics	Block 4	7.5 ECTS
	Thesis Preparation Project	Block 1-5	7.5 ECTS

Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.3.4 Projects.

Projects

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may

not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Microbiology includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

2.4 Protein Chemistry

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Protein Chemistry

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Protein Chemistry***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Protein Chemistry*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Protein Chemistry***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK22003U	Protein Research Lab – Intrinsically Disordered Proteins	Block 1	7.5 ECTS
NKEA06015U	Crystallography	Block 2	7.5 ECTS
NBIA05014U	Structural Bioinformatics	Block 2	7.5 ECTS

NBIK16001U	NMR Spectroscopy	Block 2	7.5 ECTS
NFYK14039U	Radioactive Isotopes and Ionizing Radiation	Block 3	7.5 ECTS
NBIK22004U	Integrative Structural Biology	Block 3+4	15 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
	Thesis Preparation Project	Block 1-5	7.5 ECTS
NBIK22002U	Advanced Protein Science 1 – Biophysical Methods	Discontinued*	7.5 ECTS

*See discontinued courses below

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.4.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Protein Chemistry includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

3 General changes for students admitted in the academic year 2022/23

Students admitted to the MSc Programme in the academic year 2022/23 must finish the programme as listed in the curriculum above with the following exceptions.

3.1 Molecular Cell Biology and Immunology

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table– Molecular Cell Biology and Immunology

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Cell Biology and Immunology***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Cell Biology and Immunology*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Cell Biology and Immunology***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15006U	Advanced Cell Biology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK15009U	Cellular Signalling in Health and Disease	Block 2	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
SMOK14003U	Chronic Inflammation. From Basic Research to Therapy	Block 3	7.5 ECTS
NBIK20005U	Cellular and Integrative Physiology	Block 3	7.5 ECTS
NBIK24002U	Molecular Mechanisms in Metabolic Disease	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS
NBIK22000U	Advanced Topics in Physiology – Lifestyle Related Diseases	Discontinued*	7.5 ECTS
NBIK23001U	Hot Topics in Physiology – Molecular Mechanisms in Lifestyle-Related Diseases	Discontinued*	7.5 ECTS

*See discontinued courses below

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.1.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Cell Biology and Immunology includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

3.2 Molecular Genetics

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Molecular Genetics

<table>
<tr><th>Period</th><th>Block 1</th><th>Block 2</th><th>Block 3</th><th>Block 4</th></tr>
<tr><td rowspan="2">1st year</td><td colspan="2">Principal Subject in Molecular Genetics</td><td>Restricted elective</td><td>Restricted elective</td></tr>
<tr><td>Elective</td><td>Elective</td><td>Restricted elective</td><td>Major Subject Project</td></tr>
<tr><td>2nd year</td><td colspan="4">Thesis</td></tr>
</table>

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Genetics*

Period	Block 3	Block 4	Block 1	Block 2
1st year	Elective	Restricted elective	*Principal Subject in Molecular Genetics*	
	Elective	Restricted elective	Major Subject Project	Restricted elective
2nd year	Thesis			

Subject elements in italics have been discontinued. See discontinued courses below.

*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15017U	Theoretical Molecular Genetics	Block 1	7.5 ECTS
NBIK15011U	Experimental Molecular Genetics	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIK15014U	Human Genetics	Block 3	7.5 ECTS
NBIA09043U	Population Genetics	Block 3	7.5 ECTS
LBIK10207U	Synthetic Biology	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS

Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.2.4 Projects.

Projects

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.

- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Genetics includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

3.3 Molecular Microbiology

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Molecular Microbiology

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Molecular Microbiology***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Molecular Microbiology*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Molecular Microbiology***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK15003U	Advanced Bacteriology 1	Block 1	7.5 ECTS
NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS

NBIK15016U	The Human Microbiome	Block 1	7.5 ECTS
NFOK22000U	Microbiological Food Safety and Quality: Control, Cases and Practicals	Block 2	7.5 ECTS
NBIK15005U	Advanced Bacteriology 2	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
NBIK17001U	Dynamic Models in Molecular Biology	Block 2	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
LBIK10136U	Heterologous Expression	Block 3	15 ECTS
NBIK16003U	Marine Microbiology and Virology	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK16000U	The Human Microbiome - Experiments	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
NNEK22001U	Metabolomics	Block 4	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analysis	Discontinued*	7.5 ECTS

*See discontinued courses below.

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.3.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Molecular Microbiology includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

3.4 Protein Chemistry

The specialisation is set at 120 ECTS and consists of the following:

- Compulsory subject elements, 22.5 ECTS
- Restricted elective subject elements, 22.5 ECTS

- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS

Table – Protein Chemistry

Period	Block 1	Block 2	Block 3	Block 4
1st year	***Principal Subject in Protein Chemistry***		**Restricted elective**	**Restricted elective**
	Elective	**Elective**	**Restricted elective**	**Major Subject Project**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.

Table – Protein Chemistry*

Period	Block 3	Block 4	Block 1	Block 2
1st year	**Elective**	**Restricted elective**	***Principal Subject in Protein Chemistry***	
	Elective	**Restricted elective**	**Major Subject Project**	**Restricted elective**
2nd year	**Thesis**			

Subject elements in italics have been discontinued. See discontinued courses below.
*This table is only relevant for students who begin the MSc Programme in February (block 3).

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Course Code	**Course Title**	**Block**	**ECTS**
NBIK22003U	Protein Research Lab – Intrinsically Disordered Proteins	Block 1	7.5 ECTS
NKEA06015U	Crystallography	Block 2	7.5 ECTS
NBIA05014U	Structural Bioinformatics	Block 2	7.5 ECTS
NBIK16001U	NMR Spectroscopy	Block 2	7.5 ECTS
NFYK14039U	Radioactive Isotopes and Ionizing Radiation	Block 3	7.5 ECTS
NBIK22004U	Integrative Structural Biology	Block 3+4	15 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
-	Thesis Preparation Project	Block 1-5	7.5 ECTS
NBIK22002U	Advanced Protein Science 1 – Biophysical Methods	Discontinued*	7.5 ECTS
NBIK10024U	Advanced Protein Science 2 – Protein Structure Determination	Discontinued*	7.5 ECTS

*See discontinued courses below

Elective subject elements
15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.4.4 Projects.

Projects
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 30 ECTS of the programme.

- Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section or the restricted elective section of the programme with 7.5 ECTS. Thesis preparation projects may not exceed 7.5 ECTS in total of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis
The MSc Programme in Biochemistry with a specialisation in Protein Chemistry includes a thesis corresponding to 60 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

4 General changes for students admitted in the academic year 2021/22

Students admitted to the MSc Programme in the academic year 2021/22 must finish the programme as listed in the curriculum above with the following exceptions.

4.1 Molecular Genetics

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Molecular Genetics in this curriculum (see above)			
SGBK20010U	Forensic Geobiology	Discontinued*	7.5 ECTS

*See discontinued courses below

4.2 Molecular Microbiology

Restricted elective subject elements

22.5 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Molecular Microbiology in this curriculum (see above)			
LLEK10219U	Control of Foodborne Microorganism	Discontinued*	7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analysis	Discontinued*	7.5 ECTS

*See discontinued courses below

5 Discontinued courses

Course Code	Course Title	ECTS	Interim arrangement
NBIK22002U	Advanced Protein Science 1 – Biophysical Methods	7.5	The course was restricted elective in the specialisation Protein Chemistry in the academic year 2024/25 and earlier. Offered for the last time: 2022/23 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2023/24
NBIK10024U	Advanced Protein Science 2 – Protein Structure Determination	7.5	The course was restricted elective in the specialisation Protein Chemistry in the academic year 2022/23 and earlier. Offered for the last time: 2022/23 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2023/24
NBIK22000U	Advanced Topics in Physiology – Lifestyle Related Diseases	7.5	The course was restricted elective in the specialisation Molecular Cell Biology and Immunology in the academic year 2022/23 and earlier. Offered for the last time: 2022/23 The course has changed title and is identical to Hot Topics in Physiology - Molecular Mechanisms in Lifestyle-Related Diseases (NBIK23001U), 7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analysis	7.5	The course was restricted elective in the specialisation Molecular Microbiology in the academic year 2022/23 and earlier. Offered for the last time: 2021/22 The course has changed title and is identical to Data Science for Genomics (NBIK23000U), 7.5 ECTS
LLEK10219U	Control of Foodborne Microorganism	7.5	The course was restricted elective in the specialisation in Molecular Microbiology in the academic year 2021/22. Offered for the last time: 2021/22 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2022/23
SGBK20010U	Forensic Geobiology	7.5	The course was restricted elective in the specialisation in Molecular Genetics in the academic year 2021/22. Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2022/23

NBIK23001U	Hot Topics in Physiology - Molecular Mechanisms in Lifestyle-Related Diseases	7.5	The course was restricted elective in the specialisation Molecular Cell Biology and Immunology in the academic year 2023/24 and earlier. Offered for the last time: 2023/24
NBIK20003U	Principal Subject in Molecular Cell Biology and Immunology	15	The course was compulsory in the specialisation Molecular Cell Biology and Immunology in the academic year 2024/25 and earlier. Offered for the last time: 2024/25. Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2025/26. The course is replaced by NBIK25000U Principal Subjects in Biochemical Research.
NBIK20002U	Principal Subject in Molecular Genetics	15	The course was compulsory in the specialisation Molecular Genetics in the academic year 2024/25 and earlier. Offered for the last time: 2024/25. Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2025/26. The course is replaced by NBIK25000U Principal Subjects in Biochemical Research.
NBIK20000U	Principal Subject in Molecular Microbiology	15	The course was compulsory in the specialisation Molecular Microbiology in the academic year 2024/25 and earlier. Offered for the last time: 2024/25. Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2025/26. The course is replaced by NBIK25000U Principal Subjects in Biochemical Research.
NBIK20001U	Principal Subject in Protein Chemistry	15	The course was compulsory in the specialisation Protein Chemistry in the academic year 2024/25 and earlier. Offered for the last time: 2024/25. Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2025/26. The course is replaced by NBIK25000U Principal Subjects in Biochemical Research.

Appendix 3 Description of objectives for the thesis

After completing the thesis, the student should have:

Knowledge about:

- Theory and methods (experimentally and theoretically) within biochemistry including the sub-disciplines molecular cell biology, molecular genetics, molecular microbiology, protein chemistry or neuroscience.
- The strength and limitations of a broad range of experimental methods in biochemistry and chemistry.
- Formulation and analysis of problems.

Skills in/to:

- Handle model organisms scientifically and safely.
- Select appropriate theories and methods to address one or more problems in a given academic frame within biochemistry including sub-disciplines e.g. molecular cell biology, molecular genetics, molecular microbiology, protein chemistry or neurobiology.
- Communicate an issue clearly and manageable in a biochemical scientific context - both in writing and orally - to the appropriate audience using sound professional biochemical terminology.
- Organize and carry out a major experimental work.
- Select and use a wide range of different methods and in silico analyses and equipment relevant to the experimental biochemical, chemical and biological analysis from their practical laboratory experience and within a given academic frame of biochemistry including biochemistry sub-disciplines e.g. molecular cell biology molecular genetics, molecular microbiology, protein chemistry or neurobiology.
- Work on personal experimental data of biochemical, biological, or chemical in nature, exhaustively and analytically.
- Comply with applicable standards and regulations for laboratory work.
- Use standard and specialized software as well as modern information technology including artificial intelligence for biochemical work.
- Journalize own laboratory work in a level of detail so that others can recreate the results.

Competences in/to:

- Implement a research-oriented project independently.
- Analyse, interpret and compare their own and others' experimental data from the underlying biochemical, biological and chemical Principals quantitatively and qualitatively.
- Put their own results in scientific biochemical, biological and chemical relevant context.
- Discuss their own data generation and relate their own data to other people's data within the given academic frame of biochemistry including relevant sub-disciplines e.g. molecular cell biology, molecular genetics, molecular microbiology, protein chemistry or neurobiology).
- Critically assess the quality, relevance and probability of their own and others' data.
- Independently develop their knowledge and skills related to biochemistry, chemistry and biology.
- Assess the safety and environmental aspects of the biochemical, biological and chemical work.