Programme-specific Section of the Curriculum for the MSc Programme in Biotechnology at the Faculty of Science, University of Copenhagen 2012 (rev. 2026)

Contents

1 Title, affiliation and language 2
2 Academic profile 2
2.1 Purpose 2
2.2 General programme profile 2
2.3 General structure of the programme 3
2.4 Career opportunities 3
3 Description of competence profiles 3
3.1 Competence profile 3
4 Admission requirements 4
4.1 Bachelor's degrees that automatically fulfil the academic requirements 4
4.2 Other Bachelor's degrees 4
4.3 Other applicants 5
4.4 Language requirements 5
4.5 Supplementary subject elements 5
5 Prioritisation of applicants 5
6 Structure of the programme 6
6.1 Programme components 6
7 Exemptions 8
8 Commencement etc. 8
8.1 Validity 8
8.2 Transfer 8
8.3 Amendment 8
Appendix 1 The recommended academic progression 9
Appendix 2 Interim arrangements 10
1 General changes for students admitted in the academic year 2025/26 10
2 General changes for students admitted in the academic year 2024/25 or 2023/24 10
3 General changes for students admitted in the academic year 2022/23 11
4 Discontinued courses 11
Appendix 3 Description of objectives for the thesis 13

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

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 Agricultural Science (*jordbrugsvidenskab*).

1.4 Language

The language of this MSc Programme is English.

2 Academic profile

2.1 Purpose

The purpose is to educate candidates in Biotechnology who can develop the building blocks for innovation and sustainable solutions to major global challenges.

The objective of the programme is to offer students a coherent profession-oriented education within the field of biotechnology. On completion of the programme, students will be able to perform research at all levels and analyse and solve questions and problems within the broad field of biotechnology.

The MSc programme is primarily within the field of natural sciences, supplied with aspects of innovation and business. The biotechnology programme is an international degree and will be conducted in English.

2.2 General programme profile

The aim of the programme is to give students:

- Both theoretical knowledge and method-oriented practical skills in applied biotechnology and biochemistry within the fields of micro-organisms, plants and animals. Insight on how to apply these organisms as model and production systems.
- The knowledge required to analyse complex biotechnology problems of importance for the biotechnological industry, governmental agencies or educational programmes.

- The ability to communicate knowledge at all levels, and a general understanding of the interactions between biotechnology, industry, society and the environment.

Biotechnology is the key subject area of the programme.

2.3 General structure of the programme
The MSc Programme is set at 120 ECTS.

There are no defined specialisations in this programme.

2.4 Career opportunities
The MSc Programme in Biotechnology qualifies students to become professionals within business functions and/or areas such as:

- Researcher/quality manager in biotechnological industry
- Scientist at research institutions
- Advisor and consultant in governmental agencies
- Product specialist in biotech sales organisations
- Biotech entrepreneur
- A PhD programme
- Educational establishments

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 Biotechnology have acquired the following:

Knowledge about:

- The biological complexities with the field of cell and organism biology and molecular biology at an advanced level including the principles of cell functions and genetic control of these processes.
- Critical reflection on the theory behind biotechnological methods.
- Model systems to obtain and integrate fundamental knowledge about organisms and to understand complex biological processes.
- The usefulness of different organisms as expression hosts in research and as production units.
- Digital tools to be able to analyse complex data sets.
- Integrated approaches to address biotechnological questions using genetics, physiology, biochemistry and bioinformatics to relate phenotypes to genotype and as platforms for modelling organism metabolism at the molecular level.
- Intellectual property rights as related to scientific discovery and biological material and business development.

Skills in/to:

- Use basic knowledge from other disciplines in an integrated manner when analysing and solving current problems in biotechnology.
- Discuss and choose techniques in molecular biology, design of laboratory protocols and safety procedures in relation to handling and use of organisms in biotechnology.
- Transfer techniques and principles to new hypotheses based on biotechnological/biochemical, and/or mathematical/statistical descriptions, which can be statistically and experimentally tested.
- Use digitalisation such as scripting to handle and analyse large and complex data sets within biotechnology.
- Use advanced methods and solutions in molecular biology in the context of a project.
- Set up preparations for a research plan, including critical discussion of literature and identification of problems, develop hypotheses and concrete research questions, determine data requirements and select appropriate methods
- Read, discuss and present original scientific articles within the field.
- Read and interpret patents within the biotechnological field.
- Communicate effectively to specialist and non-specialist audience at a variety of levels, using modern and appropriate information and communication tools.

Competences in/to:

- Transfer theories and principles from advanced state-of-the-art molecular biology to solve new questions posed by the research community, the industry and the society.
- Find innovative solutions based on sustainability perspectives and climate neutral development.
- Independently apply the right digital tools for different analytical purposes and how to complete the process in experimental design.
- Work effectively in teams as well as independently, apply project management in cross-disciplinary environments.
- Use lifelong learning as a principle to independently evaluate and structure learning processes and assume responsibility for continuous professional development.

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 Biotechnology:

- Biotechnology (*bioteknologi*) from University of Copenhagen (reserved access)

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 Biotechnology if the programme includes the following:

- 15 ECTS within a biological system (plants, animals or microbiology)
- 15 ECTS within biochemistry/organic chemistry
- 15 ECTS within biotechnology methods
- In total, the applicant must have a minimum of 30 ECTS derived from courses with experimental laboratory exercises.

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:

- An entrance examination with an English level comparable to the Danish level B or higher from a country within EU/EEA or Switzerland
- 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
- IELTS test score of minimum 6.5 with at least 6.0 in each sub score
- TOEFL test score of minimum 83 with at least 20 in each sub score
- Cambridge Advanced English (CAE) or Cambridge English: Proficiency (CPE) with a minimum score of 180 (C1-level)

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 Biotechnology from University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Biotechnology 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:

Grades in relevant courses in biological system (plants, animals or microbiology), biochemistry/organic chemistry and biotechnology methods and courses with experimental laboratory exercises.

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, 7.5 ECTS
- Restricted elective subject elements, 37.5 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 (7.5 ECTS):

Course Code	Course Title	Block	ECTS
NPLK19000U	Big Data in Biotechnology	Block 1	7.5 ECTS

6.1.2 Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following list:

Course Code	Course Title	Block	ECTS
NPLK13003U	Advanced Analytical Chemistry - Sampling and Sample Preparation	Block 1	7.5 ECTS
NPLK17001U	Advanced Microbial Biotechnology	Block 1	7.5 ECTS
SBIK19001U	Basic Immunology	Block 1	7.5 ECTS
NIFK14026U	Entrepreneurship and Innovation	Block 1	7.5 ECTS
LBIK10135U	Genome and Cell Biology	Block 1	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
SBIA21001U	Applied Python Programming for Bio-Medical-sciences	Block 2	7.5 ECTS
NNEK16003U	Bioactive Food Components and Health	Block 2	7.5 ECTS
NIGK21037U	Biorefinery - From Plants to Bioenergy, Biochemicals, Biomaterials, and High Value Products	Block 2	7.5 ECTS
NBIK15009U	Cellular Signalling in Health and Disease	Block 2	7.5 ECTS
SBIK19002U	Current and Experimental Immunology	Block 2	7.5 ECTS
NPLK19004U	Enzymology and Experimental Biochemistry	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NFOK14025U	Quantitative Bio-spectroscopy	Block 2	7.5 ECTS
NFOK21000U	Advanced Chemometrics and Machine Learning	Block 3	7.5 ECTS
SVEK23001U	CRISPR Tsunami: Design and Hands on Gene Editing	Block 3	7.5 ECTS
NPLK22002U	Data Processing in Environmental Science and Agriculture	Block 3	7.5 ECTS
NPLK25002U	Functional Biodiversity*	Block 3	7.5 ECTS
SMOK14002U	Gene Therapy	Block 3	7.5 ECTS
LBIK10136U	Heterologous Expression	Block 3	15 ECTS

Course Code	Course Title	Block	ECTS
SVEK17001U	Laboratory Animal Science Function ABD	Block 3	7.5 ECTS
LBIK10207U	Synthetic Biology	Block 3	7.5 ECTS
NIFK14026U	Entrepreneurship and Innovation	Block 4	7.5 ECTS
SBIK22001U	Experimental Medical Microbiology: From Gene to Function in Pathogenic Bacteria	Block 4	7.5 ECTS
LBIK10214U	Frontiers in Plant Science	Block 4	7.5 ECTS
SBIK26001U	Advanced Biotechnology and Intellectual Property Rights	Block 4	7.5 ECTS
NKEK22004U	Protein Structure and Function in Biomedicine and Sustainable Biotechnology	Block 5	7.5 ECTS

* The course is cancelled for the study year 2026/27

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 may be included in the elective section of the programme with up to 15 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. 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 primary supervisor must be employed at SCIENCE. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects may not be included in the elective section of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

6.1.5 Thesis

The MSc Programme in Biotechnology 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.

The primary supervisor must be employed at either SCIENCE or SUND.

6.1.6 Academic Mobility

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

For students admitted in September the academic mobility for the MSc Programme in Biotechnology is placed in block 3+4 of the 1st year.

For students admitted in February the academic mobility for the MSc Programme in Biotechnology is placed in block 1+2 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 Biotechnology

Period	Block 1	Block 2	Block 3	Block 4
1st year	Big Data in Biotechnology	Elective	Restricted elective	Restricted elective
	Restricted elective	Elective	Restricted elective	Restricted elective
2nd year	Thesis			

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

Table – MSc Programme in Biotechnology*

Period	Block 1	Block 2	Block 3	Block 4
1st year	Restricted elective	Elective	Big Data in Biotechnology	Restricted elective
	Restricted elective	Elective	Restricted elective	Restricted elective
2nd year	Thesis			

*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 2025/26

Students admitted to the MSc Programme in the academic year 2025/26 must finish the programme as listed in the curriculum above with the following exceptions.

Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following list:

Restricted elective subject elements offered as part of this curriculum (see above)			
Course Code	**Course Title**	**Block**	**ECTS**
SBIK10194U	Advanced Biotechnology and Intellectual Property Rights	Discontinued*	15 ECTS
NPLK15000U	Basic Parasitology	Discontinued*	7,5 ECTS
NPLK19005U	Fundamentals of Beer Brewing and Wine Making - Biochemistry, Organisms and Omics Techniques	Discontinued*	7,5 ECTS
NPLK25005U	Quality assessment and Legislation- From Idea to Product	Discontinued*	7,5 ECTS
NBIK14035U	Medical Bacteriology	Discontinued*	7,5 ECTS

*See discontinued courses below.

2 General changes for students admitted in the academic year 2024/25 or 2023/24

Students admitted to the MSc Programme in the academic year 2024/25 or 2023/24 must finish the programme as listed in the curriculum above with the following exceptions.

Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following list:

Restricted elective subject elements offered as part of this curriculum (see above)			
Course Code	**Course Title**	**Block**	**ECTS**
LBIK10202U	Molecular Plant-Microbe Interactions	Discontinued*	7.5 ECTS
SBIK10194U	Advanced Biotechnology and Intellectual Property Rights	Discontinued*	15 ECTS
NPLK15000U	Basic Parasitology	Discontinued*	7,5 ECTS
NPLK19005U	Fundamentals of Beer Brewing and Wine Making - Biochemistry, Organisms and Omics Techniques	Discontinued*	7,5 ECTS
NBIK14035U	Medical Bacteriology	Discontinued*	7,5 ECTS

*See discontinued courses below.

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.

Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following list:

Restricted elective subject elements offered as part of this curriculum (see above)			
Course Code	**Course Title**	**Block**	**ECTS**
NFYK14039U	Radioactive Isotopes and Ionizing Radiation	Block 3	7.5 ECTS
LBIK10202U	Molecular Plant-Microbe Interactions	Discontinued*	7.5 ECTS
SBIK10194U	Advanced Biotechnology and Intellectual Property Rights	Discontinued*	15 ECTS
NPLK15000U	Basic Parasitology	Discontinued*	7,5 ECTS
NPLK19005U	Fundamentals of Beer Brewing and Wine Making - Biochemistry, Organisms and Omics Techniques	Discontinued*	7,5 ECTS
NBIK14035U	Medical Bacteriology	Discontinued*	7,5 ECTS

*See discontinued courses below.

4 Discontinued courses

Course Code	Course Title	ECTS	Interim arrangement
SBIK10194U	Advanced Biotechnology and Intellectual Property Rights	15 ECTS	The course was restricted elective in the academic year 2025/26 and earlier. Offered for the last time: 2025/26 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2026/27.
NPLK15000U	Basic Parasitology	7,5 ECTS	The course was restricted elective in the academic year 2025/26 and earlier. Offered for the last time: 2025/26 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2026/27.
NPLK19005U	Fundamentals of Beer Brewing and Wine Making - Biochemistry, Organisms and Omics Techniques	7,5 ECTS	The course was restricted elective in the academic year 2025/26 and earlier. Offered for the last time: 2025/26

			Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2026/27.
NBIK14035U	Medical Bacteriology	7,5 ECTS	The course was restricted elective in the academic year 2025/26 and earlier. Offered for the last time: 2025/26 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2026/27.
LBIK10202U	Molecular Plant-Microbe Interactions	7.5	The course was restricted elective in the academic year 2024/25. Offered for the last time: 2024/25 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2025/26
NPLK25005U	Quality assessment and Legislation- From Idea to Product	7,5 ECTS	The course was restricted elective in the academic year 2025/26 and earlier. Offered for the last time: 2025/26 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2026/27.

Appendix 3 Description of objectives for the thesis

After completing the thesis, the student should have:

Knowledge about:

- How to identify scientific problems within the biotechnological area.
- How to summarize a suitable combination of methodologies and theories based on international research for use in defining the problem formulation.
- How to design, conduct and analyse experiments.
- How to discuss theories and models on the basis of sustainable biotechnological solutions with a high degree of independence.

Skills in/to:

- Apply and critically evaluate theories and methods within the field including their applicability and limitations.
- Discuss academic issues that arises from the thesis.
- Make conclusions in a clear and academic manner in relation to the problem formulation and the outcome of the experiments.
- Discuss and communicate the academic and social significance, if any, of the thesis based on ethical principles.
- Substantiate the idea of conducting experimenting to shed light on the topics as decided in the problem formulation.
- Process data through a choice of academic analysis methods and present findings objectively and in a concise manner.
- Assess the credibility of own findings based on relevant data processing and literature.

Competences in/to:

- Initiate and perform academic work in a biotechnological research context.
- Solve complex problems and designing experiments in a professional context.
- Presenting and disseminating scientific results.