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

2009 (rev. 2026)

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

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*).
- In addition, examiners from other corps can be brought in for subject elements not covered by the primary corps.

1.4 Language

The language of this MSc Programme is English.

2 Academic profile

2.1 Purpose

The programme is taught in English and the objective is to produce graduates with extensive, internationally competitive knowledge of a particular area of experimental molecular biomedicine, who have carried out a significant independent experimental project within this academic field. In addition, the programme aims to provide graduates with an extensive knowledge of the molecular mechanisms of disease and knowledge of relevant bioinformatics and statistical working methods.

2.2 General programme profile

The programme is composed of an experimental Master's thesis project and compulsory courses in human molecular pathology, statistics and data science for genomics. Elective courses provide the opportunity to individualize the MSc programme.

Molecular insight into the function of the human body in health and disease and acquisition of skills in computational analyses of large data sets are key subject areas 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 Molecular Biomedicine qualifies students to become professionals within business functions and/or areas such as:

- A PhD programme
- Membership of research groups in the biomedical industry, providing independent contributions to experimental work and internal debates.
- Teamwork in method development and quality control in the biomedical industry, hospitals and the healthcare sector in general.

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 Molecular Biomedicine have acquired the following:

Knowledge about:

- A large part of recent original literature within their chosen thesis field as well as some original literature within several other fields in molecular biomedicine.
- Human molecular pathology.
- Relevant statistical theories and methods.
- Relevant bioinformatics tools and methods.
- Locate, evaluate and summarise up-to-date knowledge within a given area of molecular biomedicine.
- Critically evaluate other researchers' results within the field of molecular biomedicine based upon a broad knowledge of the methodology and critical analysis within the field.
- Discuss relevant molecular biomedical challenges and solutions in the context of health and disease as well as sustainability.

Skills in/to:

- Communicate research-based knowledge and discuss professional and biomedical problem areas with both fellow specialists and non-specialists.
- Document knowledge and experimental work in a manner that meets the requirements set out by international scientific publications.
- Understand and reflect, scientifically, on the current knowledge of molecular biomedicine and identify molecular biomedical problems that can be solved by experimental and computational means.
- Evaluate and choose from within their thesis area's scientific theories, methods, tools and techniques in order to construct a problem-solving strategy for a hitherto unsolved molecular biomedical problem.

Competences in/to:

- Formulate, structure and carry out an independent molecular biomedical research project.

- Manage complex work and development situations that they are not familiar with in advance and which require new problem-solving models.
- Independently take responsibility for their own academic development and specialisation.
- Independently initiate and carry out collaborations both within their field and across scientific fields and take on professional responsibility.
- Assess the importance and involvement of molecular biomedical research and development in public health and sustainability.

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 Molecular Biomedicine:

- Molecular Biomedicine (molekylær biomedicin) from University of Copenhagen (reserved access)
- 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 Molecular Biomedicine if the programme includes the following:

- A minimum of 60 ECTS of formal classes in the fields of protein chemistry, cell biology, molecular biology and human physiology of which a minimum of 30 ECTS must be from courses in molecular biology.
- Relevant laboratory experience equivalent to a minimum of 30 ECTS from courses, projects etc. (must be documented).

For informational purpose - Bachelor's degrees that have previously been assessed as qualifying meeting the specified ECTS

Applicants with a Bachelor's degree in Biochemistry from the University of Copenhagen are qualified for admission if the programme includes the following:

- A minimum of 22.5 ECTS from courses in cell biology.
- A minimum of 15 ECTS from courses in human physiology.

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 Subclause 4.1-5.

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 Molecular Biomedicine from University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Molecular Biomedicine 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 the following subjects:
  1) Human/mammalian molecular biology.
  2) Human/mammalian cell biology.
  3) Human physiology.
  4) Protein chemistry.
  5) Finally, the extent of the applicant's documented experience of relevant laboratory work will be assessed.

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, 30 ECTS
- Restricted elective subject elements, 15 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 (30 ECTS):

Course Code	Course Title	Block	ECTS
SMOK15001U	Molecular Pathology	Block 1+2	15 ECTS
SGBK26002U	Statistics for Molecular Biomedicine	Block 3	7.5 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS

6.1.2 Restricted elective subject elements

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

Course Code	Course Title	Block	ECTS
SBIK19001U	Basic Immunology	Block 1	7.5 ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NIFK14026U	Entrepreneurship and Innovation	Block 1	7.5 ECTS
NBIK15016U	The Human Microbiome	Block 1	7.5 ECTS
SBIA21001U	Applied Python Programming for Biomedical Sciences	Block 2	7.5 ECTS
SBIK19002U	Current and Experimental Immunology	Block 2	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
NBIA05014U	Structural Bioinformatics	Block 2	7.5 ECTS
NBIK20005U	Cellular and Integrative Physiology	Block 3	7.5 ECTS
SVEK23001U	CRISPR Tsunami: Design and Hands on Gene Editing	Block 3	7.5 ECTS
SFAK20007U	Entrepreneurship in Pharmaceuticals	Block 3	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
SMOK14002U	Gene Therapy	Block 3	7.5 ECTS
NNEK21003U	Gut Microbiome in Nutrition and Health	Block 3	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
NBIK24002U	Molecular Mechanisms in Metabolic Disease	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
NNEK22001U	Metabolomics	Block 4	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
SFKKIL004U	Neuropharmacology	Block 4	7.5 ECTS
SVEK17001U	Laboratory Animal Science Function ABD	Block 1-4	7.5 ECTS
NKEK22004U	Protein Structure and Function in Biomedicine and Sustainable Biotechnology	Block 5	7.5 ECTS
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
	Thesis Preparation Project	Block 1-5	7.5 ECTS
	Project in Practice	Block 1-5	15 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 15 ECTS may be included in the MSc Programme.
- Projects. See 6.1.4 Projects.

6.1.4 Projects

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

- PUK may be included in the elective section of the programme with 7.5 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.
- PIP may be included in the elective and/or restricted elective section of the programme with 15 ECTS. The primary supervisor must be employed at SCIENCE. PIP may be written as a combination of the restricted elective and elective section of the programme. PIP may not exceed 15 ECTS in total of the programme. The regulations are described in Appendix 4 to the shared section of the curriculum.
- PREP may be included in the elective or restricted elective section of the programme with 7.5 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 6 to the shared section of the curriculum.

6.1.5 Thesis

The MSc Programme in Molecular Biomedicine 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 the Faculty of Science or the Faculty of Health and Medical Sciences at the University of Copenhagen.

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 Molecular Biomedicine is placed in block 1+2 or 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.

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

Table – MSc Programme in Molecular Biomedicine

Period	Block 1	Block 2	Block 3	Block 4
1st year	Molecular Pathology		Statistics for Molecular Biomedicine	Data Science for Genomics
	Elective	Restricted elective	Elective	Restricted elective
2nd year	Thesis			

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

Table – MSc Programme in Molecular Biomedicine*

Period	Block 3	Block 4	Block 1	Block 2
1st year	Statistics for Molecular Biomedicine	Data Science for Genomics	Molecular Pathology	
	Elective	Restricted elective	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.

Table – MSc Programme in Molecular Biomedicine

Period	Block 1	Block 2	Block 3	Block 4
1st year	Molecular Pathology		*Statistics for Molecular Biomedicine*	Data Science for Genomics
	Elective	Restricted elective	Elective	Restricted elective
2nd year	Thesis			

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

Table – MSc Programme in Molecular Biomedicine*

Period	Block 3	Block 4	Block 1	Block 2
1st year	*Statistics for Molecular Biomedicine*	Data Science for Genomics	Molecular Pathology	
	Elective	Restricted elective	Elective	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)

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.

Table – MSc Programme in Molecular Biomedicine

Period	Block 1	Block 2	Block 3	Block 4
	Molecular Pathology		*Statistics for Molecular Biomedicine*	Data Science for Genomics

Period	Block 1	Block 2	Block 3	Block 4
1st year	Elective	Restricted elective	Elective	Restricted elective
2nd year	Thesis			

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

Table – MSc Programme in Molecular Biomedicine*

Period	Block 3	Block 4	Block 1	Block 2
1st year	*Statistics for Molecular Biomedicine*	Data Science for Genomics	Molecular Pathology	
	Elective	Restricted elective	Elective	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
15 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**
NBIK23001U	Hot Topics in Physiology - Molecular Mechanisms in Life-Style-Related Diseases	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.

Table – MSc Programme in Molecular Biomedicine

Period	Block 1	Block 2	Block 3	Block 4
1st year	Molecular Pathology		*Statistics for Molecular Biomedicine*	*Bioinformatics of High Throughput Analyses*
	Elective	Restricted elective	Elective	Restricted elective
2nd year	Thesis			

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

Table – MSc Programme in Molecular Biomedicine*

Period	Block 3	Block 4	Block 1	Block 2
1st year	***Statistics for Molecular Biomedicine***	***Bioinformatics of High Throughput Analyses***	**Molecular Pathology**	
	Elective	**Restricted elective**	**Elective**	**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
15 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**
NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NBIK15017U	Theoretical Molecular Genetics	Block 1	7.5 ECTS
NBIK26000U	Advanced Bacteriology	Block 1	7.5 ECTS
NBIK26002U	Virus, Microbe and Host	Block 2	7.5 ECTS
NIFK14032U	Business Development and Innovation	Block 3	7.5 ECTS
SMOK14003U	Chronic Inflammation. From Basic Research to Therapy	Block 3	7.5 ECTS
NBIK15014U	Human Genetics	Block 3	7.5 ECTS
NDAK16003U	Introduction to Data Science (IDS)	Block 3	7.5 ECTS
NFYK14009U	Physics of Molecular Diseases	Block 4	7.5 ECTS
NBIK22000U	Advanced Topics in Physiology - Lifestyle Related Diseases	Discontinued*	7.5 ECTS
NBIK23001U	Hot Topics in Physiology - Molecular Mechanisms in Life-Style-Related Diseases	Discontinued*	7.5 ECTS

*See discontinued courses below.

4 Discontinued courses

Course Code	Course Title	ECTS	Interim arrangement
NBIK15003U	Advanced Bacteriology 1	7.5	The course was restricted elective in the study year 2022/23 and earlier. Offered for the last time: 2025/26 The course is identical to Advanced Bacteriology (NBIK26000U), 7,5 ECTS

Course Code	Course Title	ECTS	Interim arrangement
NBIK15005U	Advanced Bacteriology 2	7.5	The course was restricted elective in the study year 2022/23 and earlier. Offered for the last time: 2025/26 The course is identical to Virus, Microbe, and Host (NBIK26002U), 7,5 ECTS
NBIK22000U	Advanced Topics in Physiology – Lifestyle Related Diseases	7.5	The course was restricted elective in the academic year 2022/23. Offered for the last time in 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 Analyses	7.5	The course was compulsory in the academic year 2022/23. Offered for the last time in 2022/23. The course has changed title and is identical with Data Science for Genomics (NBIK23000U), 7.5 ECTS
NBIK23001U	Hot Topics in Physiology – Molecular Mechanisms in Lifestyle-Related Diseases	7.5	The course was restricted elective in the academic year 2023/24 and earlier. Offered for the last time: 2023/24 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2024/25
NBIA08011U	Statistics for Molecular Biomedicine	7,5	The course was compulsory in the academic year 2025/26 and earlier. Offered for the last time: 2025/26 The course is identical with Statistics for Molecular Biomedicine (SGBK26002U), 7,5 ECTS.

Appendix 3 Description of objectives for the thesis

After completing the thesis, the student should have:

Knowledge about:

- The latest original literature within their chosen thesis field.
- Knowledge about present methods in molecular biomedicine, their individual strengths and weaknesses.
- Statistical theories and methods relevant for the experimental thesis work.
- Bioinformatics tools and methods relevant for the experimental thesis work.

Skills in/to:

- Use an extended array of experimental methods and the associated equipment to analyse a problem in biomedical sciences.
- Maintain a professional level laboratory notebook, detailing all of the student's experimental work.
- Independently initiate and carry out collaborations both within their field and across scientific fields and take on professional responsibility.
- Communicate research-based knowledge and discuss professional and biomedical problem areas with both fellow specialists and non-specialists.

Competences in/to:

- Formulate, structure and carry out an independent experimental molecular biomedical research project.
- Document their knowledge and experimental work at a level that meets the requirements set out by international scientific publications.
- Discuss their work and its connection to the field in general at a level that meets the requirements set out by international scientific publications.
- Evaluate and choose from within their thesis area's scientific theories, methods, tools and techniques in order to construct a problem-solving strategy for a hitherto unsolved molecular biomedical problem.
- Identify molecular biomedical problem areas that can be solved experimentally.
- Identify, evaluate and summarize the newest knowledge within a given area of molecular biomedicine.