



# Programme-specific Section of the Curriculum for the MSc Programme in Biology at the Faculty of Science, University of Copenhagen 2012 (Rev. 2024)

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

### 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 objective of the programme is to provide the graduates with an in-depth knowledge within the methods and scientific basis of biological research. The education is based on the competences the students have acquired during the BSc study programme. On completion of the programme, students will be able to perform research at advanced levels and analyse and solve questions and problems within broad fields of biology including societal problems e.g. concerning environmental issues and sustainability or human health.

### 2.2 General programme profile

The student can choose between 5 different specialisations, acquiring expertise within a cluster of related subjects. Within each specialisation the student can choose between different subject elements covering a range of topics. In addition, the student is allowed to follow supplementary courses within other disciplines.

Biology is the key subject area of the programme.

### 2.3 General structure of the programme

The MSc Programme is set at 120 ECTS.

The MSc Programme in Biology consists of the following elements:

- Specialisation, 120 ECTS incl. thesis.

The student can choose one of the following specialisations:

- Molecular Biology and Genetics.
- Cell Biology and Physiology.
- Microbiology.
- Ecology.
- Marine Biology.

## 2.4 Career opportunities

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

- A PhD programme
- Research.
- Teaching.
- Biotech-, pharmaceutical and related industries.
- Public administration.
- Private consultancies.
- Non-governmental organisations (NGO's).
- Publishing industry.

## 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 Generic competence profile

Graduates holding an MSc in Biology have acquired the following regardless of the chosen specialisation:

#### Knowledge about:

- State-of-the-art within a particular specialisation in biology.
- Current biological problems relevant to industry and society and their possible solutions.
- State-of-the-art IT solutions to obtain, analyse and store biological data.

#### Skills in/to:

- Apply the most recent and most advanced experimental techniques, measuring methods and equipment in the field and/or in the laboratory.
- Analyse, interpret and critically evaluate experimental complex stratified biological data from a range of methods.
- Summarise a research subject based on original scientific literature.
- Use appropriate software solutions for data analysis and statistics.
- Search and use scientific information critically.

#### Competences in/to:

- Manage, advice on and conduct research into biological systems, based on in-depth biological knowledge of the systems.
- Hypothesise, independently formulate and conduct experiments, in the field and/or in the laboratory, and explain, communicate and put into perspective a scientific problem, both orally and in writing.
- Combine and further develop advanced methods and techniques, including the competences required to evaluate the complexity of the data collected, sources of error and methodological uncertainties.
- Applying academic knowledge and skills to suggest innovative sustainable solutions for relevant problems in industry and society.
- Disseminate knowledge about the subject area in both academic and non-academic contexts.

### 3.2 Molecular Biology and Genetics

In addition to the generic competence profile, graduates holding an MSc in Biology with a specialisation in Molecular Biology and Genetics have acquired the following:

#### Knowledge about:

- Genomic structure, organisation and function.
- Genomic structural elements, including centromeres, telomeres, transposons and gene regulatory sequences.
- The structure and regulation of chromatin in post-translational modifications.
- Genomics, transcriptomics, proteomics and other ‘omics’ technologies.
- Causes, diagnosis and inheritance of human genetic diseases.
- Genetic strategies for therapeutic intervention in human genetic diseases.
- Rules and regulations governing work with genetically modified organisms.

#### Skills in/to:

- Set up, perform and evaluate genetic and genomic screens.
- Design and construct genetically modified cells for biotechnological and biopharmaceutical purposes.
- Apply bioinformatical methods and databases to analyse DNA, RNA and protein sequences.
- Evaluate the applicability of molecular and genetic methods for specific model systems.

#### Competences in/to:

- Summarise the genetic and epigenetic basis for cellular functions.
- Identify differences and similarities between different cell types.
- Link genetic and epigenetic processes and regulation mechanisms.
- Integrate genetic, epigenetic and molecular mechanisms with an overall understanding of cellular functions.
- Apply molecular and genetic knowledge to understand human diseases.

### **3.3 Cell Biology and Physiology**

In addition to the generic competence profile, graduates holding an MSc in Biology with a specialisation in Cell Biology and Physiology have acquired the following:

#### Knowledge about:

- The structure, organisation and function of cells.
- The physiology of organs and whole organisms.
- Subcellular structures, including organelles, membrane systems and the cytoskeletons.
- Signal transduction systems (intra and intercellular) used to regulate cell development, growth, differentiation, motility and death as well as to regulate cell and tissue homeostasis during various physiological functions.

#### Skills in/to:

- Choose and conduct experimental studies on cellular kinetics and physiology.
- Apply relevant methods specific to physiological evaluation.
- Evaluate the applicability of cellular and physiological methods for specific model systems.

#### Competences in/to:

- Summarise the function of eukaryotic cells and cellular homeostasis.
- Compare the strategies by which eukaryotic cells interact and communicate with the extracellular environment to regulate development, gene expression, differentiation and physiological activity.
- Link cellular processes and regulatory mechanisms, including the competences required to integrate the interactions between cells in the same organ and cells in different organs.

- Integrate cellular and molecular mechanisms in cell-cell interaction and signal transduction with an overall understanding of the function and development of tissues and organs.
- Relate the overall construction of the cell and the organ to understanding of multi-cellular animals, including humans.
- Summarise the organism's primary physiological systems, their normal function and response during homeostatic disturbances and in response to selected diseases.
- Integrate knowledge into the description and analysis of important physiological and pathophysiological contexts in human beings.

### 3.4 Microbiology

In addition to the generic competence profile, graduates holding an MSc in Biology with a specialisation in Microbiology have acquired the following:

#### Knowledge about:

- Prokaryotes' physiology, molecular biology, activity, occurrence, interactions, symbiosis with animals and pathogenicity in humans.
- The use of microbes and microbial processes to provide sustainable solutions to environmental problems in e.g. agriculture or waste handling.
- Digital tools incl. relevant programming and analysis tools.

#### Skills in/to:

- Cultivate and isolate microorganisms.
- Use selected state-of-the-art molecular techniques to study the molecular biology, activity, physiology, interactions and occurrences of microorganisms.
- Demonstrate Good Laboratory Practice.
- Critically use appropriate bioinformatics tools to handling, analyzing and storing biological sequence data

#### Competences in/to:

- Evaluate the structural and functional adaptations that enable prokaryotes to live as single-celled organisms or in close interaction with eukaryotes.
- Develop and critically evaluate selected molecular methods for the study of microorganisms.
- Put into perspective the importance of the molecular biology of microorganisms in a societal context, e.g. in relation to bacterial resistance to antibiotics and microorganisms as a source of new industrial enzymes and other bioactive substances.
- Evaluate and put into perspective the importance of the interactions of microorganisms with their surroundings and other organisms, including humans.
- Describe the physiological and molecular aspects of the pathogenicity of bacteria in humans.
- Integrate molecular mechanisms behind microbial evolution.

### 3.5 Ecology

In addition to the generic competence profile, graduates holding an MSc in Biology with a specialisation in Ecology have acquired the following:

#### Knowledge about:

- Fundamental ecological and evolutionary processes.
- Drivers of spatial and temporal distribution of species.
- Whole-organism biology of bacteria, fungi, protists and multicellular organisms of importance to ecosystem function and organisms typical of specific environments.
- The function of ecosystems and their interaction with local, regional and global systems, including global change.

- Applied and societal aspects of ecology and evolution.

#### Skills in/to:

- Collect, identify, and isolate selected groups of organisms.
- Use genetic methods in species identification and typing.
- Apply appropriate experimental designs for subsequent statistical analysis of ecological data.
- Analyse the occurrence and activity of organisms in relation to the physical/chemical environment.

#### Competences in/to:

- Understand and present the structure and function of complex ecosystems.
- Advise on environmental management issues.
- Illustrate and analyse biological phenomena by distinguishing between immediate (how?) and evolutionary (why?) causes and explanations.
- Explain and discuss the distribution and density of species at both local and global scales.
- Evaluate the occurrence of species in the wild on both an ecological and an evolutionary timescale.
- Explain and discuss the evolutionary adaptations of organisms to a given environment and their behaviour in relation/response to individuals of the same and other species.
- Evaluate interactions between individuals at different trophic levels, e.g., plants/herbivores, prey/predators, and host organisms/parasites/diseases.
- Apply knowledge of ecology in the management of stocks, biodiversity and animal welfare.
- Apply knowledge of ecology and biogeochemical cycling in ongoing discussions on global change scenarios and sustainability of land-use practices.

### **3.6 Marine Biology**

In addition to the generic competence profile, graduates holding an MSc in Biology with a specialisation in Marine Biology have acquired the following:

#### Knowledge about:

- The complexity of marine ecosystems, biodiversity as well as the conversion of energy and matter in the ocean.
- Marine habitat types, their distribution, structure and origin.
- Marine microorganisms and animal groups, their relationship, morphology, physiology as well as feed intake and life history strategies.

#### Skills in/to:

- Collect, identify and categorise marine organisms into overall groups.
- Use genetic methods in species identification and typing.

#### Competences in/to:

- Describe the structure and function of marine ecosystems on a micro, macro and mega scale.
- Explain the fluxes of energy and organic and inorganic matter in marine systems.
- Explain how marine organisms adapt to the physical, chemical and biological characteristics of different ecosystems as well as how they respond to changes in them.
- Analyse and interpret highly complex marine data using modern methods of quantitative analysis.
- Apply knowledge gained from the program in the management of marine ecosystems and stocks.
- Identify sustainable solutions to environmental problems in aquatic production systems.

## 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 Biology:

- Biology (*biologi*) 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 Biology if the programme includes the following:

A minimum of 5 ECTS within each of the following areas:

- organismal biology,
- ecology,
- evolution biology,
- cell biology,
- physiology,
- molecular biology
- microbiology
- statistics,
- chemistry,
- biochemistry.

Practical skills within laboratory and field work within the main areas of biology corresponding to a total of 30 ECTS.

### 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 4.1-3.

### 4.4 Language requirements

Applicants must as a minimum document English language qualifications comparable to a Danish upper secondary school English B level or English proficiency corresponding to the tests and scores required. Accepted tests and required minimum scores are published online at [www.science.ku.dk](http://www.science.ku.dk).

### 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 Biology from University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Biology 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 achieved within the following areas:
  - Organismal biology
  - Ecology
  - Evolutionary biology
  - Cell biology
  - Physiology
  - Molecular biology
  - Microbiology
  - Statistics
  - Chemistry
  - Biochemistry
  - Practical skills within laboratory and field work within the main areas of biology

## 6 Structure of the programme

The compulsory subject elements, restricted 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).

Before the beginning of the MSc Programme the student will choose a specialisation.

### 6.1 Molecular Biology and Genetics

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS (thesis 60 ECTS).
- Restricted elective subject elements, 45 ECTS (thesis 45 ECTS)
- Elective subject elements, 15 ECTS.
- Thesis, 45 or 60 ECTS.

#### 6.1.1 Compulsory subject elements

All of the following subject elements are to be covered (15 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK15017U	Theoretical Molecular Genetics	Block 1	7.5 ECTS
NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS

### 6.1.2 Restricted elective subject elements

Course Code	Course Title	Block	ECTS
30 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
45 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK10017U	RNA Biology	Block 1	7.5 ECTS
NIFK14026U	Entrepreneurship and Innovation*	Block 1	7.5 ECTS
NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
NBIK17001U	Dynamical Models in Molecular Biology	Block 2	7.5 ECTS
NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
SGBK23001U	Host-Microbiota Multi-Omics	Block 2	7.5 ECTS
NBIK15014U	Human Genetics	Block 3	7.5 ECTS
NBIA09043U	Population Genetics	Block 3	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
NBIA08011U	Statistics for Molecular Biomedicine	Block 3	7.5 ECTS
NIFK14032U	Business Development and Innovation*	Block 3	7.5 ECTS
SVEK23001U	CRISPR Tsunami: Design and Hands on Gene Editing	Block 3	7.5 ECTS
NBIK22004U	Integrative Structural Biology	Block 3+4	15 ECTS
NBIK11009U	Experimental Cell Biology	Block 4	15 ECTS
NBIK23000U	Data Science for Genomics	Block 4	7.5 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NNEK22001U	Metabolomics	Block 4	7.5 ECTS
NKEK22004U	Protein Structure and Function in Biomedicine and Sustainable Biotechnology	Block 5	7.5 ECTS
NFKK14001U	Project outside the course scope	Block 1-5	7.5 ECTS
NFKK14006U	Project in Practice	Block 1-5	15 ECTS
	Thesis preparation project	Block 1-5	7.5 ECTS

\*Only one of the courses can be included in the programme.

### 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.
- All courses at GLOBE Institute SUND, affiliated with a SCIENCE Study Board, are preapproved as elective courses.
- Projects. See 6.1.4 Projects.

### 6.1.4 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 (PUK) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PUK may not exceed 15 ECTS in total of the programme. PUK may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.

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

### 6.1.5 Thesis

The MSc Programme in Biology with a specialisation in Molecular Biology and Genetics includes a thesis corresponding to 45 or 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 GLOBE Institute SUND.

### 6.1.6 Academic mobility

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

For students admitted in September the academic mobility for the MSc Programme in Biology with a specialisation in Molecular Biology and Genetics is placed in block 3+4 of the 1<sup>st</sup> year.

For students admitted in February the academic mobility for the MSc Programme in Biology with a specialisation in Molecular Biology and Genetics is placed in block 3+4 of the 1<sup>st</sup> 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.

## 6.2 Cell Biology and Physiology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS (thesis 60 ECTS).
- Restricted elective subject elements, 45 ECTS (thesis 45 ECTS).
- Elective subject elements, 15 ECTS.
- Thesis, 45 or 60 ECTS.

### 6.2.1 Compulsory subject elements

The following subject elements are to be covered (15 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK15006U	Advanced Cell Biology	Block 1	7.5 ECTS
NBIK20005U	Cellular and Integrative Physiology	Block 3	7.5 ECTS

### 6.2.2 Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
45 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
NBIK15016U	The Human Microbiome	Block 1	7.5 ECTS
NIFK14026U	Entrepreneurship and Innovation*	Block 1	7.5 ECTS
NBIK15009U	Cellular Signaling in Health and Disease	Block 2	7.5 ECTS
NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
NBIK15019U	Sensory Biology	Block 3	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
NBIA08011U	Statistics for Molecular Biomedicine	Block 3	7.5 ECTS
NIFK14032U	Business Development and Innovation*	Block 3	7.5 ECTS
SVEK23001U	CRISPR Tsunami: Design and Hands on Gene Editing	Block 3	7.5 ECTS
NBIK22004U	Integrative Structural Biology	Block 3+4	15 ECTS
NBIK24002U	Molecular Mechanisms in Metabolic Disease	Block 4	7.5 ECTS
NBIK11009U	Experimental Cell Biology	Block 4	15 ECTS
NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
NBIK16000U	The Human Microbiome – Experiments	Block 4	7.5 ECTS
NNEK22001U	Metabolomics	Block 4	7.5 ECTS
NKEK22004U	Protein Structure and Function in Biomedicine and Sustainable Biotechnology	Block 5	7.5 ECTS
NFKK14001U	Project outside the course scope	Block 1-5	7.5 ECTS
NFKK14006U	Project in practice	Block 1-5	15 ECTS
	Thesis preparation project	Block 1-5	7.5 ECTS

\*Only one of the courses can be included in the programme.

### 6.2.3 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.
- All courses at GLOBE Institute SUND, affiliated with a SCIENCE Study Board, are preapproved as elective courses.
- Projects. See 6.2.4 Projects.

### 6.2.4 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 (PUK) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PUK may not exceed 15 ECTS in total of the programme. PUK may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice (PIP) may be included in the elective or restricted elective section of the programme with 15 ECTS. PIP may not exceed 15 ECTS in total of the programme. PIP may be written as a combination of the restricted elective and

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

### 6.2.5 Thesis

The MSc Programme in Biology with a specialisation in Cell Biology and Physiology includes a thesis corresponding to 45 or 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 GLOBE Institute SUND.

### 6.2.6 Academic mobility

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

For students admitted in September the academic mobility for the MSc Programme in Biology with a specialisation in Cell Biology and Physiology is placed in block 3+4 of the 1<sup>st</sup> year.

For students admitted in February the academic mobility for the MSc Programme in Biology with a specialisation in Cell Biology and Physiology is placed in block 3+4 of the 1<sup>st</sup> 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.

## 6.3 Microbiology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS (thesis 60 ECTS).
- Restricted elective subject elements, 45 ECTS (thesis 45 ECTS)
- Elective subject elements, 15 ECTS.
- Thesis, 45 or 60 ECTS.

### 6.3.1 Compulsory subject elements

All of the following subject elements are to be covered (15 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK15003U	Advanced Bacteriology 1	Block 1	7.5 ECTS
NBIK15005U	Advanced Bacteriology 2	Block 2	7.5 ECTS

### 6.3.2 Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):

45 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):

Course Code	Course Title	Block	ECTS
NBIK15016U	The Human Microbiome	Block 1	7.5 ECTS
NPLK15000U	Basic Parasitology	Block 1	7.5 ECTS
NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
NPLK17001U	Advanced Microbial Biotechnology	Block 1	7,5 ECTS
NIFK14026U	Entrepreneurship and Innovation*	Block 1	7.5 ECTS
NBIK20000U	Principal Subject in Molecular Microbiology	Block 1+2	15 ECTS
NBIK14007U	Soil Biology	Block 2	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
NBIK14009U	Protists – Eucaryotic Microbiology	Block 2	7.5 ECTS
NBIK17001U	Dynamical Models in Molecular Biology	Block 2	7.5 ECTS
SBIK10200U	Human Parasitology	Block 2	7.5 ECTS
SGBK23001U	Host-Microbiota Multi-Omics	Block 2	7.5 ECTS
NBIK14035U	Medical Bacteriology	Block 3	7.5 ECTS
NBIK16003U	Marine Microbiology and Virology	Block 3	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
NBIA09043U	Population Genetics	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology (StatBio)	Block 3	7.5 ECTS
NNEK21003U	Gut Microbiome in Nutrition and Health	Block 3	7.5 ECTS
NIFK14032U	Business Development and Innovation*	Block 3	7.5 ECTS
SVEK23001U	CRISPR Tsunami: Design and Hands on Gene Editing	Block 3	7.5 ECTS
SBIK22001U	Experimental Medical Microbiology: From Gene to Function in Pathogenic Bacteria	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
NFKK14001U	Project outside the course scope	Block 1-5	7.5 ECTS
NFKK14006U	Project in practice	Block 1-5	15 ECTS
	Thesis preparation project	Block 1-5	7.5 ECTS

\*Only one of the courses can be included in the programme.

### 6.3.3 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.
- All courses at GLOBE Institute SUND, affiliated with a SCIENCE Study Board, are preapproved as elective courses.
- Projects. See 6.3.4 Projects.

### 6.3.4 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 (PUK) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PUK may not exceed 15 ECTS in total of the programme. PUK may

be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.

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

### 6.3.5 Thesis

The MSc Programme in Biology with a specialisation in Microbiology includes a thesis corresponding to 45 or 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 GLOBE Institute SUND.

### 6.3.6 Academic mobility

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

For students admitted in September the academic mobility for the MSc Programme in Biology with a specialisation in Microbiology is placed in block 3+4 of the 1<sup>st</sup> year.

For students admitted in February the academic mobility for the MSc Programme in Biology with a specialisation in Microbiology is placed in block 3+4 of the 1<sup>st</sup> 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.

## 6.4 Ecology

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

- Compulsory subject elements, 7.5 ECTS.
- Restricted elective subject elements, 37.5 ECTS (thesis 60 ECTS).
- Restricted elective subject elements, 52.5 ECTS (thesis 45 ECTS)
- Elective subject elements, 15 ECTS.
- Thesis, 45 or 60 ECTS.

### 6.4.1 Compulsory subject elements

The following subject element is to be covered (7.5 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK15007U	Advanced Ecology	Block 1	7.5 ECTS

#### 6.4.2 Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
52.5 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK14021U	Evolutionary Ecology	Block 1	7.5 ECTS
NPLK15000U	Basic Parasitology	Block 1	7.5 ECTS
NBIK23002U	Danske naturtyper, økologi og karakteristik	Block 1	7.5 ECTS
SGBK21001U	Field Mycology and Identification of Fungi	Block 1	7.5 ECTS
LNAK10099U	Biodiversity in Urban Nature	Block 1	7.5 ECTS
NIFK14026U	Entrepreneurship and Innovation*	Block 1	7.5 ECTS
SGBK20002U	Macroecology and Community Ecology	Block 2	7.5 ECTS
NBIK14022U	Methodology and Sampling in Environmental Management	Block 2	7.5 ECTS
NBIK14007U	Soil Biology	Block 2	7.5 ECTS
NBIK14001U	Climate Change and Biogeochemical Cycles	Block 2	7.5 ECTS
NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
NBIK12003U	Conservation Biology	Block 2	7.5 ECTS
NBIK14010U	Social Behaviour and Communication	Block 3	7.5 ECTS
NBIA09043U	Population Genetics	Block 3	7.5 ECTS
SGBK20003U	Ornithology	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology (StatBio)	Block 3	7.5 ECTS
NIGK16000U	Applied Ecosystem Ecology	Block 3	7.5 ECTS
NIGK14002U	Geographical Information Systems (GIS)	Block 3	7.5 ECTS
NBIK15019U	Sensory Biology	Block 3	7.5 ECTS
NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
SGBK20011U	International Nature Conservation	Block 3	7.5 ECTS
NIFK14032U	Business Development and Innovation*	Block 3	7.5 ECTS
NBIK14018U	Terrestrial Ecosystem Processes and Global Change	Block 4	7.5 ECTS
NNMK24000U	Animal Diversity and Evolution	Block 4	7.5 ECTS
NBIK14017U	Invasion Biology	Block 4	7.5 ECTS
NBIK14013U	Arctic Biology	Block 4	7.5 ECTS
NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS
LNAK10010U	Environmental Impact Assessment	Block 4	7.5 ECTS
SGBK20007U	Climate Change and Biodiversity	Block 4	7.5 ECTS
NIGK14008U	VVM i praksis	Block 4	7.5 ECTS
NBIK18001U	Arctic Biology Field Course	Block 5	7.5 ECTS
NBIK24000U	Videregående plantebestemmelse	Block 5	7.5 ECTS
NBIK24001U	Marine Animal Diversity, Monitoring, and Habitats	Block 5	7.5 ECTS
NFKK14001U	Project outside the course scope	Block 1-5	7.5 ECTS
NFKK14006U	Project in practice	Block 1-5	15 ECTS
	Thesis preparation project	Block 1-5	7.5 ECTS

\*Only one of the courses can be included in the programme.

#### 6.4.3 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.
- All courses at GLOBE Institute SUND, affiliated with a SCIENCE Study Board, are preapproved as elective courses.
- Projects. See 6.4.4 Projects.

#### **6.4.4 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 (PUK) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PUK may not exceed 15 ECTS in total of the programme. PUK may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice (PIP) may be included in the elective or restricted elective section of the programme with 15 ECTS. PIP may not exceed 15 ECTS in total of the programme. PIP may be written as a combination of the restricted elective and elective section of the programme. 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 (PREP) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PREP may not exceed 15 ECTS in total of the programme. PREP may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 6 to the shared section of the curriculum.

#### **6.4.5 Thesis**

The MSc Programme in Biology with a specialisation in Ecology includes a thesis corresponding to 45 or 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 GLOBE Institute SUND.

#### **6.4.6 Academic mobility**

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

For students admitted in September the academic mobility for the MSc Programme in Biology with a specialisation in Ecology is placed in block 3+4 of the 1<sup>st</sup> year.

For students admitted in February the academic mobility for the MSc Programme in Biology with a specialisation in Ecology is placed in block 3+4 of the 1<sup>st</sup> 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.

Students may choose to obtain 45 ECTS (excluding the thesis) at a 4EU+ partner university in order to obtain a double degree.

Current options available include: University of Warsaw, Poland.

Candidates apply for the double degree option in the first semester of their MSc programme.

## 6.5 Marine Biology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS (thesis 60 ECTS).
- Restricted elective subject elements, 45 ECTS (thesis 45 ECTS)
- Elective subject elements, 15 ECTS
- Thesis, 45 or 60 ECTS.

### 6.5.1 Compulsory subject elements

The following subject element is to be covered (15 ECTS):			
Course Code	Course Title	Block	ECTS
NBIK21001U	Marine Biology	Block 1	7.5 ECTS
NBIK21002U	Experimental Marine Biology	Block 1	7.5 ECTS

### 6.5.2 Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
45 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
Course Code	Course Title	Block	ECTS
NIFK14026U	Entrepreneurship and Innovation*	Block 1	7.5 ECTS
NBIK14009U	Protists - Eukaryotic Microbiology	Block 2	7.5 ECTS
NBIK14005U	The Biology of Fish	Block 2	7.5 ECTS
NBIK14022U	Methodology and Sampling in Environmental Management	Block 2	7.5 ECTS
NBIK16003U	Marine Microbiology and Virology	Block 3	7.5 ECTS
NBIK15019U	Sensory Biology	Block 3	7,5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology (StatBio)	Block 3	7.5 ECTS
NIFK14032U	Business Development and Innovation*	Block 3	7.5 ECTS
NNMK24000U	Animal Diversity and Evolution	Block 4	7.5 ECTS
NBIK14013U	Arctic Biology	Block 4	7.5 ECTS
NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS
NIGK14008U	VVM i praksis	Block 4	7.5 ECTS
LNAK10010U	Environmental Impact Assessment	Block 4	7.5 ECTS
NBIK24001U	Marine Animal Diversity, Monitoring, and Habitats	Block 5	7.5 ECTS
NBIK18001U	Arctic Biology Field Course	Block 5	7.5 ECTS
NFKK14001U	Project outside the course scope	Block 1-5	7.5 ECTS
NFKK14006U	Project in Practice	Block 1-5	15 ECTS
	Thesis preparation project	Block 1-5	7.5 ECTS

\*Only one of the courses can be included in the programme.

### 6.5.3 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.
- All courses at GLOBE Institute SUND, affiliated with a SCIENCE Study Board, are preapproved as elective courses.
- Projects. See 6.5.4 Projects

#### **6.5.4 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 (PUK) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PUK may not exceed 15 ECTS in total of the programme. PUK may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice (PIP) may be included in the elective or restricted elective section of the programme with 15 ECTS. PIP may not exceed 15 ECTS in total of the programme. PIP may be written as a combination of the restricted elective and elective section of the programme. 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 (PREP) may be included in the elective section of the programme with up to 15 ECTS and the restricted elective section of the programme with 7.5 ECTS. PREP may not exceed 15 ECTS in total of the programme. PREP may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or GLOBE Institute SUND. The regulations are described in Appendix 6 to the shared section of the curriculum.

#### **6.5.5 Thesis**

The MSc Programme in Biology with a specialisation in Marine Biology includes a thesis corresponding to 45 or 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 GLOBE Institute SUND.

#### **6.5.6 Academic mobility**

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

For students admitted in September the academic mobility for the MSc Programme in Biology with a specialisation in Marine Biology is placed in block 3+4 of the 1<sup>st</sup> year.

For students admitted in February the academic mobility for the MSc Programme in Biology with a specialisation in Marine Biology is placed in block 3+4 of the 1<sup>st</sup> 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 Amendments**

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](http://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 – Molecular Biology and Genetics (thesis 60 ECTS)**

	Block 1	Block 2	Block 3	Block 4
1st year	Theoretical Molecular Genetics	Experimental Higher Model Organisms	Restricted elective	Restricted elective
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Thesis			

**Table – Molecular Biology and Genetics (thesis 45 ECTS)**

	Block 1	Block 2	Block 3	Block 4
1st year	Theoretical Molecular Genetics	Experimental Higher Model Organisms	Restricted elective	Restricted elective
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Restricted elective	Thesis		
	Restricted elective			

**Table – Cell Biology and Physiology (60 ECTS)**

	Block 1	Block 2	Block 3	Block 4
1st year	Advanced Cell Biology	Restricted elective	Cellular and Integrative Physiology	Elective
	Restricted elective	Restricted elective	Restricted elective	Elective
2nd year	Thesis			

**Table – Cell Biology and Physiology (45 ECTS)**

	Block 1	Block 2	Block 3	Block 4
1st year	Advanced Cell Biology	Restricted elective	Cellular and Integrative Physiology	Elective
	Restricted elective	Restricted elective	Restricted elective	Elective
2nd year	Restricted elective	Thesis		
	Restricted elective			

**Table – Microbiology (thesis 60 ECTS)**

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

**Table – Microbiology (thesis 45 ECTS)**

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

**Table – Ecology (thesis 60 ECTS)**

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

**Table – Ecology (thesis 45 ECTS)**

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

**Table – Marine Biology (thesis 60 ECTS)**

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

**Table – Marine Biology (thesis 45 ECTS)**

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

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

**Table – Molecular Biology and Genetics (thesis 60 ECTS)\***

	Block 3	Block 4	Block 1	Block 2
1st year	Restricted elective	Restricted elective	Theoretical Molecular Genetics	Experimental Higher Model Organisms
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Thesis			

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

**Table – Molecular Biology and Genetics (thesis 45 ECTS)\***

	Block 3	Block 4	Block 1	Block 2
1st year	Restricted elective	Restricted elective	Theoretical Molecular Genetics	Experimental Higher Model Organisms
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Restricted elective	Thesis		
	Restricted elective			

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

**Table – Cell Biology and Physiology (thesis 60 ECTS)\***

	Block 3	Block 4	Block 1	Block 2
1st year	Cellular and Integrative Physiology	Restricted elective	Advanced Cell Biology	Restricted elective
	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)

**Table – Cell Biology and Physiology (thesis 45 ECTS)\***

	Block 3	Block 4	Block 1	Block 2
1st year	Cellular and Integrative Physiology	Restricted elective	Advanced Cell Biology	Restricted elective
	Elective	Elective	Restricted elective	Restricted elective
2nd year	Restricted elective	Thesis		
	Restricted elective			

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

**Table – Microbiology (thesis 60 ECTS)\***

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

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

**Table – Microbiology (thesis 45 ECTS)\***

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

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

**Table – Ecology (thesis 60 ECTS)\***

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

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

**Table – Ecology (thesis 45 ECTS)\***

	<b>Block 3</b>	<b>Block 4</b>	<b>Block 1</b>	<b>Block 2</b>
<b>1st year</b>	Elective	Elective	Advanced Ecology	Restricted elective
	Restricted elective	Restricted elective	Restricted elective	Restricted elective
<b>2nd year</b>	Restricted elective	Thesis		
	Restricted elective			

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

**Table – Marine Biology (thesis 60 ECTS)\***

	<b>Block 3</b>	<b>Block 4</b>	<b>Block 1</b>	<b>Block 2</b>
<b>1st year</b>	Restricted elective	Restricted elective	Marine Biology	Elective
	Restricted elective	Restricted elective		Elective
<b>2nd year</b>	Thesis			

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

**Table – Marine Biology (thesis 45 ECTS)\***

	<b>Block 3</b>	<b>Block 4</b>	<b>Block 1</b>	<b>Block 2</b>
<b>1st year</b>	Restricted elective	Restricted elective	Marine Biology	Elective
	Restricted elective	Restricted elective		Elective
<b>2nd year</b>	Restricted elective	Thesis		
	Restricted elective			

\*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 2023/2024

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.

#### 1.1 Cell Biology and Physiology

##### Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
45 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
Restricted elective subject elements offered as part of the specialisation in Cell Biology and Physiology in this curriculum (see above)			
NBIK23001U	Hot Topics in Physiology –Molecular Mechanisms in Lifestyle Related Diseases	Discontinued*	7.5 ECTS

\* See discontinued courses below.

#### 1.2 Ecology

##### Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
52.5 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
Restricted elective subject elements offered as part of the specialisation in Ecology in this curriculum (see above)			
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NBIK15000U	Advanced Plant Identification	Discontinued*	7.5 ECTS

\* See discontinued courses below.

#### 1.3 Marine Biology

##### Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis 60 ECTS):			
45 ECTS are to be covered as subject elements from the following list (thesis 45 ECTS):			
Restricted elective subject elements offered as part of the specialisation in Marine Biology in this curriculum (see above)			
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS

\* See discontinued courses below.

### 2 General changes for students admitted in the academic year 2022/2023

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.

## 2.1 Molecular Biology and Genetics

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

**Table – Molecular Biology and Genetics (students admitted September)**

	Block 1	Block 2	Block 3	Block 4
1st year	Theoretical Molecular Genetics	Experimental Higher Model Organisms	Restricted elective	Restricted elective
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Thesis			

**Table – Molecular Biology and Genetics\* (students admitted February)**

	Block 3	Block 4	Block 1	Block 2
1st year	Restricted elective	Restricted elective	Theoretical Molecular Genetics	Experimental Higher Model Organisms
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Thesis			

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

### Restricted elective subject elements

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

Restricted elective subject elements offered as part of the specialisation in Molecular Biology and Genetics in this curriculum (see above)

NBIK15011U	Experimental Molecular Genetics	Block 1	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analyses	Discontinued*	7.5 ECTS

\* See discontinued courses below.

## 2.2 Cell Biology and Physiology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

**Table – Cell Biology and Physiology (students admitted September)**

	Block 1	Block 2	Block 3	Block 4
1st year	Advanced Cell Biology	Restricted elective	Cellular and Integrative Physiology	Elective
	Restricted elective	Restricted elective	Restricted elective	Elective
2nd year	Thesis			

**Table – Cell Biology and Physiology\* (students admitted February)**

	Block 3	Block 4	Block 1	Block 2
1st year	Cellular and Integrative Physiology	Restricted elective	Advanced Cell Biology	Restricted elective
	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)

### Restricted elective subject elements

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

Restricted elective subject elements offered as part of the specialisation in Molecular Biology and Genetics in this curriculum (see above)

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.

### 2.3 Microbiology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

**Table – Microbiology (students admitted September)**

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

**Table – Microbiology\* (students admitted February)**

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

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

**Restricted elective subject elements**

30 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Microbiology in this curriculum (see above)			
SBIK10182U	From Gene to Function in Pathogenic Bacteria	Discontinued*	7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analyses	Discontinued*	7.5 ECTS

\* See discontinued courses below.

**2.4 Ecology**

The specialisation 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.

**Table – Ecology (students admitted September)**

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

**Table – Ecology\* (students admitted February)**

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

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

### 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 the specialisation in Ecology in this curriculum (see above)			
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
NBIK15018U	Danish Natural Habitats, Ecology and Characterization	Discontinued*	7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NBIK15000U	Advanced Plant Identification	Discontinued*	7.5 ECTS

\* See discontinued courses below.

### 2.5 Marine Biology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS.

**Table – Marine Biology (students admitted September)**

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

**Table – Marine Biology\* (students admitted February)**

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

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

### Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Marine Biology in this curriculum (see above)			
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS

\* See discontinued courses below.

### 3 General changes for students admitted in the academic year 2021/2022

Students admitted to the MSc Programme in the academic year 2020/21 must finish the programme as listed in the curriculum above with the following exceptions.

#### 3.1 Molecular Biology and Genetics

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

**Table – Molecular Biology and Genetics (students admitted September)**

	Block 1	Block 2	Block 3	Block 4
1st year	Theoretical Molecular Genetics	Experimental Higher Model Organisms	Restricted elective	Restricted elective
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Thesis			

**Table – Molecular Biology and Genetics\* (students admitted February)**

	Block 3	Block 4	Block 1	Block 2
1st year	Restricted elective	Restricted elective	Theoretical Molecular Genetics	Experimental Higher Model Organisms
	Restricted elective	Restricted elective	Elective	Elective
2nd year	Thesis			

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

#### Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Molecular Biology and Genetics in this curriculum (see above)			
NBIK15011U	Experimental Molecular Genetics	Block 1	7.5 ECTS
NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analyses	Discontinued*	7.5 ECTS
SGBK20010U	Forensic Biology	Discontinued*	7.5 ECTS

\* See discontinued courses below.

### 3.2 Cell Biology and Physiology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

**Table – Cell Biology and Physiology (students admitted September)**

	Block 1	Block 2	Block 3	Block 4
1st year	Advanced Cell Biology	Restricted elective	Cellular and Integrative Physiology	Elective
	Restricted elective	Restricted elective	Restricted elective	Elective
2nd year	Thesis			

**Table – Cell Biology and Physiology\* (students admitted February)**

	Block 3	Block 4	Block 1	Block 2
1st year	Cellular and Integrative Physiology	Restricted elective	Advanced Cell Biology	Restricted elective
	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)

#### Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Cell Biology and Physiology in this curriculum (see above)			
NBIK20006U	Advanced Topics in Physiology	Discontinued*	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.

### 3.3 Microbiology

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

**Table – Microbiology (students admitted September)**

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

**Table – Microbiology\* (students admitted February)**

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

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

### Restricted elective subject elements

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

Restricted elective subject elements offered as part of the specialisation in Microbiology in this curriculum (see above)

SBIK10182U	From Gene to Function in Pathogenic Bacteria	Discontinued*	7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analyses	Discontinued*	7.5 ECTS

\* See discontinued courses below.

### 3.4 Ecology

The specialisation 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.

**Table – Ecology (students admitted September)**

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

**Table – Ecology\* (students admitted February)**

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

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

**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 the specialisation in Ecology in this curriculum (see above)			
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
NBIK15018U	Danish Natural Habitats, Ecology and Characterization	Discontinued*	7.5 ECTS
SGBK20010U	Forensic Biology	Discontinued*	7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NBIK15000U	Advanced Plant Identification	Discontinued*	7.5 ECTS

\* See discontinued courses below.

**3.5 Marine Biology**

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

- Compulsory subject elements, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS
- Thesis, 60 ECTS.

**Table – Marine Biology (students admitted September)**

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

**Table – Marine Biology\* (students admitted February)**

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

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

### Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list:			
Restricted elective subject elements offered as part of the specialisation in Marine Biology in this curriculum (see above)			
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS

### 4 General changes for students admitted in the academic year 2020/2021

Students admitted to the MSc Programme in the academic year 2020/21 must finish the programme as listed in the curriculum above with the following exceptions.

#### 4.1 Ecology

The specialisation 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.

**Table – Ecology (students admitted September)**

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

**Table – Ecology\* (students admitted February)**

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

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

### 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 the specialisation in Ecology in this curriculum (see above)			
SGBK22000U	Forensic Biology	Block 5	7.5 ECTS
NNMK14010U	Field Mycology and Identification of Fungi	Discontinued*	7.5 ECTS
SGBK20010U	Forensic Biology	Discontinued*	7.5 ECTS
NBIK15018U	Danish Natural Habitats, Ecology and Characterization	Discontinued*	7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	Discontinued*	7.5 ECTS
NBIK15000U	Advanced Plant Identification	Discontinued*	7.5 ECTS

\* See discontinued courses below.

### 5 Discontinued courses

Course Code	Course Title	ECTS	Interim arrangement
NBIK15000U	Advanced Plant Identification	7.5	The course was restricted elective on the specialisations Ecology 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.
NBIK20006U	Advanced Topics in Physiology	7.5	The course was restricted elective on the specialisations Cell Biology and Physiology in the academic year 2021/22. Offered for the last time: 2018/19 The course is identical to Advanced Topics in Physiology - Lifestyle Related Diseases (NBIK22000U), 7.5 ECTS
NBIK22000U	Advanced Topics in Physiology – Lifestyle Related Diseases	7.5	The course was restricted elective on the specialisations Cell Biology and Physiology in the academic year 2022/23 and earlier. Offered for the last time: 2022/23 The course is identical to Hot Topics in Physiology - Molecular Mechanisms in Lifestyle-Related Diseases (NBIK23001U), 7.5 ECTS
NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	7.5	The course was restricted elective on the specialisations Ecology and Marine Biology in the academic year 2023/24 and earlier. Offered for the last time: 2023/24 The course is identical to Animal Diversity and Evolution (NNMK24000U), 7.5 ECTS
NBIA07023U	Bioinformatics of High Throughput Analyses	7.5	The course was restricted elective on the specialisation Molecular Biology and Genetics and Microbiology 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.

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS</b>	<b>Interim arrangement</b>
NBIK15018U	Danish Natural Habitats, Ecology and Characterization	7.5	The course was restricted elective on the specialisation Ecology 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.
NNMK14010U	Field Mycology and Identification of Fungi	7.5	The course was restricted elective on the specialisation Ecology in the academic year 2020/21. Offered for the last time: 2020/21. The course is identical to Field Mycology and Identification of Fungi (SGBK21001U) 7.5 ECTS.
SGBK20010U	Forensic Geobiology	7.5	The course was restricted elective on the specialisations Molecular Biology and Genetics and Ecology in the academic year 2021/22 and 2020/21. Offered for the last time: 2021/22 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2022/23.
SBIK10182U	From Gene to Function in Pathogenic Bacteria	7.5	The course was restricted elective on the specialisation Microbiology in the academic year 2021/22 and 2020/21. Offered for the last time: 2021/22 The course is identical to Experimental Medical Microbiology: From Gene to Function in Pathogenic Bacteria (SBIK22001U), 7.5 ECTS
NBIK23001U	Hot Topics in Physiology - Molecular Mechanisms in Lifestyle-Related Diseases	7.5	The course was restricted elective on the specialisation Cell Biology and Physiology 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.
NBIK14008U	Marine Biology	15	The course was compulsory on the specialisation Marine Biology in the academic year 2020/21. Offered for the last time: 2020/21 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2021/22.
NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	7.5	The course was restricted elective on the specialisations Ecology and Marine Biology in the academic year 2023/24 and earlier. Offered for the last time: 2023/24. The course is identical to Marine Animal Diversity, Monitoring, and Habitats (NBIK24001U), 7.5 ECTS

## Appendix 3 Description of objectives for the thesis

After completing the thesis, the student should have:

### Knowledge about:

- Scientific problems within the study programme's subject areas.
- Methodologies/theories based on international research for use in his/her work with the problem formulation.
- How to apply and critically evaluate theories/methodologies, including their applicability and limitations.
- How the production and interpretation of findings/material depend on the theory/methodology chosen and the delimitation chosen.
- How to discuss academic issues arising from the thesis.
- How to draw conclusions in a clear and academic manner in relation to the problem formulation and, more generally, considering the topic and the subject area.
- How to discuss and communicate the academic and social significance, if any, of the thesis.

### Skills in/to:

- Apply and critically evaluate theories/methodologies, including their applicability and limitations.
- Assess the extent to which the production and interpretation of findings/material depend on the theory/methodology chosen and the delimitation chosen.
- Discuss academic issues arising from the thesis.
- Draw conclusions in a clear and academic manner in relation to the problem formulation and, more generally, considering the topic and the subject area.
- Discuss and communicate the academic and social significance, if any, of the thesis based on ethical principles.

If the thesis includes experimental content/own data production, the student will also be able to:

- Substantiate the idea of conducting experimental work/producing own data in order to shed light on the topic as formulated 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.

### Competences in/to:

- Initiate and perform biological investigations in a research context.
- Analyse complex biological problems and draw conclusions and suggest solutions in a work context.