



# Programme-specific Section of the Curriculum for the MSc Programme in Biology at the Faculty of Science, University of Copenhagen 2012 (Rev. 2019)

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## 1 Title, affiliation and language

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

### 1.1 Title

The MSc Programme in Biology with a specialisation in Molecular Biology and Genetics leads to a Master of Science (MSc) in Biology with a specialisation in Molecular Biology and Genetics with the Danish title: *Cand.scient. (candidatus/candidata scientiarum) i biologi med en specialisering i molekylærbiologi og genetik.*

The MSc Programme in Biology with a specialisation in Cell Biology and Physiology leads to a Master of Science (MSc) in Biology with a specialisation in Cell Biology and Physiology with the Danish title: *Cand.scient. (candidatus/candidata scientiarum) i biologi med en specialisering i cellebiologi og fysiologi.*

The MSc Programme in Biology with a specialisation in Microbiology leads to a Master of Science (MSc) in Biology with a specialisation in Microbiology with the Danish title: *Cand.scient. (candidatus/candidata scientiarum) i biologi med en specialisering i mikrobiologi.*

The MSc Programme in Biology with a specialisation in Ecology leads to a Master of Science (MSc) in Biology with a specialisation in Ecology with the Danish title: *Cand.scient. (candidatus/candidata scientiarum) i biologi med en specialisering i økologi.*

The MSc Programme in Biology with a specialisation in Marine Biology leads to a Master of Science (MSc) in Biology with a specialisation in Marine Biology with the Danish title: *Cand.scient. (candidatus/candidata scientiarum) i biologi med en specialisering i marinbiologi.*

### 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.

## 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.
- 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

On completion of the programme a MSc in Biology has 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.

#### 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.

#### Competences in/to:

- Manage, advise 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.
- Disseminate knowledge about the subject area in both academic and non-academic contexts.

### **3.2 Molecular Biology and Genetics**

On completion of the programme a MSc in Biology with a specialisation in Molecular Biology and Genetics has acquired the following in addition to the generic competence profile:

#### 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**

On completion of the programme a MSc in Biology with a specialisation in Cell Biology and Physiology has acquired the following in addition to the generic competence profile:

#### 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**

On completion of the programme a MSc in Biology with a specialisation in Microbiology has acquired the following in addition to the generic competence profile:

#### Knowledge about:

- Prokaryotes' physiology, molecular biology, activity, occurrence, interactions, symbiosis with animals and pathogenicity in humans.

#### 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.

#### 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

On completion of the programme a MSc in Biology with a specialisation in Ecology has acquired the following in addition to the generic competence profile:

#### 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.

#### Competences in/to:

- Understand and present the structure and function of complex ecosystems.
- Analyse the occurrence and activity of organisms in relation to the physical/chemical environment.
- Use organisms and genetic resources in an industrial context.
- 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 biology in the management of stocks, biodiversity and animal welfare.

### 3.6 Marine Biology

On completion of the programme a MSc in Biology with a specialisation in Marine Biology has acquired the following in addition to the generic competence profile:

#### 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.

## 4 Admission requirements

With a Bachelor's degree in Biology from the University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Biology if the student applies before the application deadline during the first application period after the completion of the Bachelor's degree.

### 4.1 Applicants with a Bachelor's degree in Biology from the University of Copenhagen

Applicants with a Bachelor's degree in Biology from the University of Copenhagen are directly academically qualified for admission to the MSc programme in Biology.

### 4.2 Applicants with a Bachelor's degree in Biology

Applicants with a Bachelor's degree in Biology from other Danish, Nordic or international universities may also be admitted if their 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 and microbiology, statistics, chemistry and biochemistry.
- Practical skills within laboratory and field work within the main areas of biology corresponding to a total of 30 ECTS.

### 4.3 Applicants with a related Bachelor's degree

Applicants with a Bachelor's degree within the areas of plant science, animal science, environmental biology, biochemistry, biology-biotechnology, molecular biomedicine or related subjects from the University of Copenhagen or other Danish, Nordic or international universities may also be admitted if their 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 and microbiology, statistics, chemistry and biochemistry.
- Practical skills within laboratory and field work within the main areas of biology corresponding to a total of 30 ECTS.

### 4.4 Other applicants

The Faculty may also admit applicants who, after an individual academic assessment, are deemed to possess educational qualifications equivalent to those required in Subclauses 4.1-3.

### 4.5 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).

### 4.6 Supplementary subject elements

The qualifications of an applicant to the MSc program are assessed exclusively on the basis of the qualifying bachelor's degree. Supplementary subject elements passed between the completion of the bachelor's program and the admission to the MSc program cannot be included in the overall assessment.

However, subject elements passed before the completion of the bachelor's program 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 program. A maximum of 30 ECTS supplementary subject elements can be included in the overall assessment.

Subject elements passed before completing the BSc programme which are to form part of the MSc programme to which the student has a legal right of admission (§9-courses) cannot be included in the overall assessment.

## 5 Prioritisation of applicants

If the number of qualified applicants to the programme exceeds the number of places available, applicants will be prioritised as follows:

- 1) Applicants with a Bachelor's degree in Biology from the University of Copenhagen seeking admission by way of direct extension of their completed BSc programme.
- 2) Applicants with a Bachelor's degree in Biology from the University of Copenhagen.
- 3) Other applicants with a Bachelor's degree in Biology.
- 4) Applicants with a Bachelor's degree in Biochemistry or Molecular Biomedicine from the University of Copenhagen.
- 5) Other applicants.

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

- Highest number of ECTS achieved within the following areas (not listed in prioritised order):
  - Organismal biology
  - Ecology
  - Evolutionary biology
  - Cell biology
  - Physiology
  - Molecular biology
  - Microbiology
  - Statistics, chemistry and 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 21 of the Ministerial Order on Bachelor and Master's Programmes (Candidatus) at Universities).

Before the beginning of the MSc Programme the student will chose 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.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

#### 6.1.1 Compulsory subject elements

All of the following subject elements are to be covered (15 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

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

• NBIK15011U	Experimental Molecular Genetics	Block 1	7.5 ECTS
• NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
• NBIK10017U	RNA Biology	Block 1	7.5 ECTS
• NBIK15010U	Epigenetics and Cell Differentiation	Block 2	7.5 ECTS
• NBIK15013U	Genome Sequence Analysis	Block 2	7.5 ECTS
• NBIK17001U	Dynamical Models in Molecular Biology	Block 2	7.5 ECTS
• NBIK14034U	Molecular Neurobiology	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
• NBIK11009U	Experimental Cell Biology	Block 4	15 ECTS
• NBIA07023U	Bioinformatics of High Throughput Analyses	Block 4	7.5 ECTS
• NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
• NBIK14020U	Archaea Biology	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

#### 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 outside the course scope may be included in the elective section of the programme with up to 15 ECTS. Projects outside course scope may not exceed 15 ECTS in total of the programme. Projects outside course scope may be written as a combination of the restricted elective and elective section of the programme The regulations are described in Appendix 5 to the shared section of the curriculum.

Projects in practice may be included in the elective section of the programme with up to 15 ECTS. Projects in practice may not exceed 15 ECTS in total of the programme. Project in practice may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 4 to the shared section of the curriculum.

#### **6.1.4 Thesis**

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

#### **6.1.5 Academic mobility**

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

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

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 (thesis full time).

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

#### **6.2.1 Compulsory subject elements**

The following subject elements are to be covered (22.5 ECTS):

• NBIK15006U	Advanced Cell Biology	Block 1	7.5 ECTS
• NBIK14014U	Cellular and Integrative Physiology	Block 3	15 ECTS

#### **6.2.2 Restricted elective subject elements**

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

• NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
• NBIK15016U	The Human Microbiome	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
• 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
• NFKK14001U	Project outside the course scope	Block 1-5	7.5 ECTS
• NFKK14006U	Project in practice	Block 1-5	15 ECTS

### **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.

Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. Projects outside course scope may not exceed 15 ECTS in total of the programme. Projects outside course scope may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 5 to the shared section of the curriculum.

Projects in practice may be included in the elective section of the programme with up to 15 ECTS. Projects in practice may not exceed 15 ECTS in total of the programme. Project in practice may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 4 to the shared section of the curriculum.

### **6.2.4 Thesis**

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

### **6.2.5 Academic mobility**

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

For students admitted in September the academic mobility for the MSc Programme in 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.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

### 6.3.1 Compulsory subject elements

All of the following subject elements are to be covered (15 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:

• 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
• 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
• SBIK10182U	From Gene to Function in Pathogenic Bacteria	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
• NBIK16000U	The Human Microbiome - Experiments	Block 4	7.5 ECTS
• NBIA07023U	Bioinformatics of High Throughput Analyses	Block 4	7.5 ECTS
• NBIK14020U	Archaea Biology	Block 4	7.5 ECTS
• NNMK17004U	Introduction to Ecological Data Analysis with R (REcoStat)	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

### 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.

Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. Projects outside course scope may not exceed 15 ECTS in total of the programme. Projects outside course scope may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 5 to the shared section of the curriculum.

Projects in practice may be included in the elective section of the programme with up to 15 ECTS. Projects in practice may not exceed 15 ECTS in total of the programme. Project in practice may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 4 to the shared section of the curriculum.

### 6.3.4 Thesis

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

### 6.3.5 Academic mobility

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

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

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 (thesis full time).

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

### 6.4.1 Compulsory subject elements

The following subject element is to be covered (7.5 ECTS):

• NBIK15007U	Advanced Ecology	Block 1	7.5 ECTS
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### 6.4.2 Restricted elective subject elements

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

• NBIK14021U	Evolutionary Ecology	Block 1	7.5 ECTS
• NPLK15000U	Basic Parasitology	Block 1	7.5 ECTS
• NBIK15018U	Danish Natural Habitats, Ecology and Characterisation	Block 1	7.5 ECTS
• NNMK14010U	Field Mycology and Identification of Fungi	Block 1	7.5 ECTS
• LNAK10099U	Biodiversity in Urban Nature	Block 1	7.5 ECTS
• NBIK15015U	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
• NNMK11002U	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
• NBIK14018U	Terrestrial Ecosystem Processes and Global Change	Block 4	7.5 ECTS
• NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	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
• NNMK15003U	Climate Change and Biodiversity	Block 4	7.5 ECTS
• NIGK14008U	VVM i praksis	Block 4	7.5 ECTS
• NNMK17004U	Introduction to Ecological Data Analysis with R (REcoStat)	Block 4	7.5 ECTS
• NBIK18001U	Arctic Biology Field Course	Block 5	7.5 ECTS
• NBIK15000U	Advanced Plant Identification	Block 5	7.5 ECTS
• NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	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

#### **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.

Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. Projects outside course scope may not exceed 15 ECTS in total of the programme. Projects outside course scope may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 5 to the shared section of the curriculum.

Projects in practice may be included in the elective section of the programme with up to 15 ECTS. Projects in practice may not exceed 15 ECTS in total of the programme. Project in practice may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 4 to the shared section of the curriculum.

#### **6.4.4 Thesis**

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

#### **6.4.5 Academic mobility**

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

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

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 (thesis full time).

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.

## 6.5 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.

### 6.5.1 Compulsory subject elements

The following subject element is to be covered (15 ECTS):

• NBIK14008U	Marine Biology	Block 1	15 ECTS
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### 6.5.2 Restricted elective subject elements

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

• 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
• NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	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
• NNMK17004U	Introduction to Ecological Data Analysis with R (REcoStat)	Block 4	7.5 ECTS
• NBIK15020U	Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates	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

### 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.

Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. Projects outside course scope may not exceed 15 ECTS in total of the programme. Projects outside course scope may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 5 to the shared section of the curriculum.

Projects in practice may be included in the elective section of the programme with up to 15 ECTS. Projects in practice may not exceed 15 ECTS in total of the programme. Project in practice may be written as a combination of the restricted elective and elective section of the programme. The regulations are described in Appendix 4 to the shared section of the curriculum.

#### **6.5.4 Thesis**

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

#### **6.5.5 Academic mobility**

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

For students admitted in September the academic mobility for the MSc Programme in 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 Tables

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

**Table – Molecular Biology and Genetics**

	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	Thesis	
2nd year	Elective	Elective	Thesis	

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

**Table – Molecular Biology and Genetics**

	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			

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

**Table – Cell Biology and Physiology**

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

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

**Table – Microbiology**

	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			

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

**Table – Microbiology**

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

Compulsory    
  Restricted elective  
 Elective

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

**Table – Ecology**

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

Compulsory    
  Restricted elective  
 Elective

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

**Table – Ecology**

	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			

Compulsory    
  Restricted elective  
 Elective

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

**Table – Marine Biology**

	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			

Compulsory    
  Restricted elective  
 Elective

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 February (winter):

**Table – Molecular Biology and Genetics\***

	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	Thesis	
2nd year	Elective	Elective	Thesis	

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

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

**Table – Molecular Biology and Genetics\***

	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			

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

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

**Table – Cell Biology and Physiology\***

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

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

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

**Table – Microbiology\***

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

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

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

**Table – Microbiology\***

	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			

Compulsory    
  Restricted elective  
 Elective

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

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

**Table – Ecology\***

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

Compulsory    
  Restricted elective  
 Elective

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

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

**Table – Ecology\***

	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			

Compulsory    
  Restricted elective  
 Elective

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

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

**Table – Marine Biology\***

	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			

Compulsory    
  Restricted elective  
 Elective

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

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

## Appendix 2 Interim arrangements

The Shared Section of the BSc and MSc Curricula for Study Programmes 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.

Different competence profiles may apply to students admitted to the programme in different academic years. Competence profiles applicable to previous admissions can be found in the Revision History for Competence Profiles at SCIENCE.

### 1 General changes for students admitted in the academic year 2018/19

Students admitted to the MSc Programme in the academic year 2018/19 must finish the programme as listed in the curriculum above with the following exceptions.

#### 1.1 Specialisations

Students admitted to the MSc Programme in the academic year 2018/19 are allowed to finish their programme with one of the specialisations that were outlined in the curriculum.

##### 1.1.1 Marine Biology

#### 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)			
• NPLK17002U	Applied Phycology	Discontinued*	7.5 ECTS

\* See course specific changes below.

### 2 General changes for students admitted in the academic year 2017/18

Students admitted to the MSc Programme in the academic year 2017/18 must finish the programme as listed in the curriculum above with the following exceptions.

#### 2.1 Specialisations

Students admitted to the MSc Programme in the academic year 2017/18 are allowed to finish their programme with one of the specialisations that were outlined in the curriculum.

##### 2.1.1 Ecology

#### 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)			
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS

\* See course specific changes below.

##### 2.1.2 Marine Biology

#### 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)			
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS
• NPLK17002U	Applied Phycology	Discontinued*	7.5 ECTS

\* See course specific changes below.

### 3 General changes for students admitted in the academic year 2016/17

Students admitted to the MSc Programme in the academic year 2016/17 must finish the programme as listed in the curriculum above with the following exceptions.

#### 3.1 Specialisations

Students admitted to the MSc Programme in the academic year 2016/17 are allowed to finish their programme with one of the specialisations that were outlined in the curriculum.

##### 3.1.1 Molecular Biology and Genetics

###### 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)			
• NBIK14012U	Biological Dynamics	Discontinued*	7.5 ECTS

\* See course specific changes below.

##### 3.1.2 Cell Biology and Physiology

###### Restricted elective subject elements

22.5 ECTS may be covered by 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)			
• NBIK12011U	Ion Transport in Cancer	Discontinued*	7.5 ECTS

\* See course specific changes below.

##### 3.1.3 Microbiology

###### 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 “Ecology” in this curriculum (see above)			
• NBIK14012U	Biological Dynamics	Discontinued*	7.5 ECTS

\* See course specific changes below.

##### 3.1.4 Ecology

###### 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)			
• NBIA08029U	Feltkursus i Naturforvaltning	Discontinued*	7.5 ECTS
• NIGK15003U	Conservation Management of Protected Natural and Semi-natural Habitats	Discontinued*	7.5 ECTS
• NBIA04058U	Danske naturtyper, økologi og karakteristik	Discontinued*	7.5 ECTS
• NBIA05050U	Makrofauna i ferskvand: Økologi og Miljøbestemmelse	Discontinued*	7.5 ECTS
• NBIK13001U	Videregående plantebestemmelse	Discontinued*	7.5 ECTS
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS

\* See course specific changes below.

##### 3.1.5 Marine Biology

###### Restricted elective subject elements

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

<ul style="list-style-type: none"> <li>• Restricted elective subject elements offered as part of the specialisation in “Marine Biology” in this curriculum (see above)</li> </ul>			
• NBIA05050U	Makrofauna i ferskvand: Økologi og Miljøbestemmelse	Discontinued*	7.5 ECTS
• NBIK14002U	Ecophysiology of Brackish Water Invertebrates	Discontinued*	7.5 ECTS
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS
• NPLK17002U	Applied Phycology	Discontinued*	7.5 ECTS

\* See course specific changes below.

#### 4 General changes for students admitted in the academic year 2015/16

Students admitted to the MSc Programme in the academic year 2015/16 must finish the programme as listed in the curriculum above with the following exceptions.

##### 4.1 Specialisations

Students admitted to the MSc Programme in the academic year 2015/16 are allowed to finish their programme with one of the specialisations that were outlined in the curriculum.

###### 4.1.1 Molecular Biology and Genetics

###### Restricted elective subject elements

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

<ul style="list-style-type: none"> <li>• Restricted elective subject elements offered as part of the specialisation in “Molecular Biology and Genetics” in this curriculum (see above)</li> </ul>			
• NBIK14012U	Biological Dynamics	Discontinued*	7.5 ECTS

\* See course specific changes below.

###### 4.1.2 Cell Biology and Physiology

The specialisation is continued in the present curriculum but has been changed in its composition of the compulsory and restricted elective subject elements. From the academic year 2016/17 it is no longer required to pass the course “Cellular Signaling in Health and Disease” as a compulsory subject element. The course can count as a restricted elective subject element.

###### Restricted elective subject elements

15 ECTS may be covered by subject elements from the following list:

<ul style="list-style-type: none"> <li>• Restricted elective subject elements offered as part of the specialisation in “Cell Biology and Physiology” in this curriculum (see above)</li> </ul>			
• NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
• NBIK10017U	RNA Biology	Block 1	7.5 ECTS
• NBIK12011U	Ion Transport in Cancer	Discontinued*	7.5 ECTS

\* See course specific changes below.

###### 4.1.3 Microbiology

###### Restricted elective subject elements

30 ECTS may be covered by subject elements from the following list:

<ul style="list-style-type: none"> <li>• Restricted elective subject elements offered as part of the specialisation in “Microbiology” in this curriculum (see above)</li> </ul>			
• NBIK13016U	Mycology	Discontinued*	7.5 ECTS
• NBIA09041U	Emerging Molecular Techniques in Microbiology	Discontinued*	7.5 ECTS
• NBIA09049U	Microbial Ecology	Discontinued*	7.5 ECTS
• NBIK14012U	Biological Dynamics	Discontinued*	7.5 ECTS

\* See course specific changes below.



#### 4.1.4 Ecology

##### Restricted elective subject elements

30 ECTS may be covered by subject elements from the following list:

• Restricted elective subject elements offered as part of the specialisation in “Ecology” in this curriculum (see above)			
• NBIK13016U	Mycology	Discontinued*	7.5 ECTS
• NBIA08029U	Feltkursus i Naturforvaltning	Discontinued*	7.5 ECTS
• NBIK15012U	Freshwater Ecology	Discontinued*	15 ECTS
• NBIA09049U	Microbial Ecology	Discontinued*	7.5 ECTS
• NBIK14000U	Ecosystem Ecology	Discontinued*	7.5 ECTS
• NIGK15003U	Conservation Management of Protected Natural and Semi-natural Habitats	Discontinued*	7.5 ECTS
• NBIA04058U	Danske naturtyper, økologi og karakteristik	Discontinued*	7.5 ECTS
• NBIA05050U	Makrofauna i ferskvand: Økologi og Miljøbestemmelse	Discontinued*	7.5 ECTS
• NBIK13001U	Videregående plantebestemmelse	Discontinued*	7.5 ECTS
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS

\* See course specific changes below.

#### 4.1.5 Marine Biology

##### Restricted elective subject elements

30 ECTS may be covered by subject elements from the following list:

• Restricted elective subject elements offered as part of the specialisation in “Marine Biology” in this curriculum (see above)			
• NBIK12009U	Marine Microbiology and Virology	Discontinued*	15 ECTS
• NBIA05050U	Makrofauna i ferskvand: Økologi og Miljøbestemmelse	Discontinued*	7.5 ECTS
• NBIK14002U	Ecophysiology of Brackish Water Invertebrates	Discontinued*	7.5 ECTS
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS
• NPLK17002U	Applied Phycology	Discontinued*	7.5 ECTS

\* See course specific changes below.

### 5 General changes for students admitted in the academic year 2014/15 or earlier

Students admitted to the MSc Programme in the academic year 2014/15 or earlier must finish the programme as listed in the curriculum above with the following exceptions.

#### 5.1 Specialisations

Students admitted to the MSc Programme in the academic year 2014/15 or earlier are allowed to finish their programme with one of the seven specialisations that were outlined in the curriculum.

In the current curricula the three specialisations: “Ecology and Evolution”, “Terrestrial Ecology” and “Aquatic Biology” are combined into a new specialisation: “Ecology”.

Four specialisations are continued in the current curricula but they have been changed in the composition of the compulsory, restricted elective and elective subject elements.

##### 5.1.1 General Profile in Biology

The specialisation is discontinued. It was offered for the last time in the academic year 2014/15.

##### Title

If this specialisation has been taken, the student will achieve the title Master of Science (MSc) in Biology. In Danish: *Cand.scient. (candidatus/candidata scientiarum) i biologi*.

##### Structure of the programme

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

- Restricted elective subject elements corresponding to 22.5, 37.5 or 52.5 ECTS.
- Elective subject elements, 37.5 ECTS.
- Thesis, 30, 45 or 60 ECTS.

### Restricted elective subject elements

22.5, 37.5 or 52.5 ECTS are to be covered as subject elements from courses from the following list:

• NBIK14021U	Evolutionary Ecology	Block 1	7.5 ECTS
• NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
• NNMK14010U	Field Mycology and Identification of Fungi	Block 1	7.5 ECTS
• NBIB10009U	Gene Technology (Bachelor level)	Block 1	15 ECTS
• NBIK10015U	Cell Cycle Control and Cancer	Block 1	7.5 ECTS
• NBIK10017U	RNA Biology	Block 1	7.5 ECTS
• NBIK14008U	Marine Biology	Block 1	15 ECTS
• NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
• NBIK14005U	The Biology of Fish	Block 2	7.5 ECTS
• NBIK14007U	Soil Biology	Block 2	7.5 ECTS
• NBIB14019U	Immunology (BA level)	Block 2	15 ECTS
• NBIK10020U	Developmental Biology	Block 2	7.5 ECTS
• NBIK15015U	Macroecology and Community Ecology	Block 2	7.5 ECTS
• NBIK14022U	Methodology and Sampling in Environmental Management	Block 2	7.5 ECTS
• NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS
• NBIK14034U	Molecular Neurobiology	Block 2	7.5 ECTS
• NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
• NFYK14039U	Radioactive Isotopes and Ionizing Radiation	Block 3	7.5 ECTS
• NBIA09043U	Population Genetics	Block 3	7.5 ECTS
• NBIK14010U	Social Behavior and Communication	Block 3	7.5 ECTS
• NBIK14014U	Cellular and Integrative Physiology	Block 3	15 ECTS
• NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
• NNMK11002U	Ornithology	Block 3	7.5 ECTS
• NBIK14020U	Archaea Biology	Block 4	7.5 ECTS
• NBIK14017U	Invasion Biology	Block 4	7.5 ECTS
• LNAK10100U	Thematic Course II: Rural Landscape Management and Planning	Block 4	15 ECTS
• NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS
• NBIK11009U	Experimental Cell Biology	Block 4	15 ECTS
• NBIK13017U	Molecular Biotechnology	Block 4	7.5 ECTS
• NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Block 4	7.5 ECTS
• NBIK14018U	Terrestrial Ecosystem Processes and Global Change	Block 4	7.5 ECTS
• NNMK14000U	International Nature Conservation	Block 5	7.5 ECTS
• NBIK14024U	Arctic Field Course	Discontinued*	7.5 ECTS
• NBIA08029U	Feltkursus i naturforvaltning	Discontinued*	7.5 ECTS
• NBIK13001U	Videregående plantebestemmelse	Discontinued*	7.5 ECTS
• NBIA04100U	Marin faunistik: Marine fisks og invertebraters diversitet og biologi	Discontinued*	7.5 ECTS
• NBIA08032U	Marinbiologisk sommerkursus	Discontinued*	7.5 ECTS
• NNMK14012U	Phylogenetic and Molecular Methods	Discontinued*	7.5 ECTS
• NNMK14009U	Entomology	Discontinued*	7.5 ECTS

• NBIA09032U	Biological Research Project	Discontinued*	7.5 ECTS
• NNDK13000U	Videregående Naturfagsdidaktik	Discontinued*	7.5 ECTS
• NNMK14011U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
• NBIA07032U	Evolution and Ancient DNA: Practice and Theory	Discontinued*	7.5 ECTS
• NBIK14012U	Biological Dynamics	Discontinued*	7.5 ECTS
• NBIA09049U	Microbial Ecology	Discontinued*	7.5 ECTS
• NBIB13012U	Epigenetics and Cell Differentiation (BA level)	Discontinued*	7.5 ECTS
• NBIA04008U	Molecular Genetics (BA level)	Discontinued*	15 ECTS
• NBIK14011U	Microbial Biotechnology	Discontinued*	7.5 ECTS
• NBIA04055U	Advanced Bacteriology	Discontinued*	15 ECTS
• NBIK10018U	Cell Biology	Discontinued*	15 ECTS
• NBIK13006U	Macro Ecology	Discontinued*	7.5 ECTS
• NBIA09041U	Emerging Molecular Techniques in Microbiology	Discontinued*	7.5 ECTS
• NBIK12011U	Ion Transport in Cancer	Discontinued*	7.5 ECTS
• NBIA04058U	Danske naturtyper, økologi og karakteristik	Discontinued*	7.5 ECTS
• NBIA05050U	Makrofauna i ferskvand: økologi og miljøbestemmelse	Discontinued*	7.5 ECTS
• NBIK12009U	Marine Microbiology and Virology	Discontinued*	15 ECTS
• NBIK14002U	Ecophysiology of Brackish Water Invertebrates	Discontinued*	7.5 ECTS

\* See course specific changes below.

### **Thesis**

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### **5.1.2 Ecology and Evolution**

#### **Title**

If a specialisation in Ecology and Evolution has been chosen, the title awarded is Master of Science in Biology with a specialisation in Ecology and Evolution.

#### **Structure of the programme**

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

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

#### **Compulsory subject elements**

The following subject elements are to be covered (15 ECTS):

• NBIK14021U	Evolutionary Ecology	Block 1	7.5 ECTS
• NBIK13006U	Macro Ecology	Discontinued*	7.5 ECTS

\* See course specific changes below.

#### **Restricted elective subject elements**

30, 45 or 60 ECTS are to be covered by subject elements from the following list:

• Restricted elective subject elements offered as part of the specialisation in “Ecology” in this curriculum (see above)			
• NBIA08004U	Evolutionary Medicine	Block 3	7.5 ECTS
• NNMK14000U	International Nature Conservation	Block 5	7.5 ECTS
• NBIK13001U	Videregående plantebestemmelse	Discontinued*	7.5 ECTS
• NBIA04100U	Marin faunistik: Marine fisks og invertebraters diversitet og biologi, sommerkursus	Discontinued*	7.5 ECTS
• NBIK13013U	Advanced Fungal Identification	Discontinued*	7.5 ECTS

• NBIA09032U	Biological Research Project within the field of ecology and evolution	Discontinued*	7.5 ECTS
• NNMK14009U	Entomology	Discontinued*	7.5 ECTS
• NNMK14011U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
• NBIA05050U	Makrofauna i ferskvand: Økologi og miljøbedømmelse	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### 5.1.3 Terrestrial Ecology

The specialisation is discontinued. It was offered for the last time in the academic year 2014/15.

### Title

If a specialisation in Terrestrial Ecology has been chosen, the title awarded is Master of Science in Biology with a specialisation in Terrestrial Ecology.

### Structure of the programme

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

- Compulsory subject elements, 22.5 ECTS.
- Restricted elective subject elements, 22.5, 37.5 or 52.5 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 30, 45 or 60 ECTS.

### Compulsory subject elements

The following subject elements are to be covered (22.5 ECTS):

• NBIK14007U	Soil Biology	Block 2	7.5 ECTS
• NBIK14018U	Terrestrial Ecosystem Processes and Global Change	Block 4	7.5 ECTS
• NBIA09049U	Microbial Ecology	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Restricted elective subject elements

22.5, 37.5 or 52.5 ECTS may be covered by subject elements from the following list:

• Restricted elective subject elements offered as part of the specialisation in “Ecology” in this curriculum (see above)			
• NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
• NBIK14022U	Methodology and Sampling in Environmental Management	Block 2	7.5 ECTS
• NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
• NBIA09032U	Biological Research Project within the field of terrestrial ecology	Discontinued*	7.5 ECTS
• NBIA04058U	Danske naturtyper, økologi og karakteristik	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### 5.1.4 Aquatic Biology

The specialisation is discontinued. It was offered for the last time in the academic year 2014/15.

### Title

If a specialisation in Aquatic Biology has been chosen, the title awarded is Master of Science in Biology with a specialisation in Aquatic Biology.

### Structure of the programme

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

- Compulsory subject elements, 22.5 ECTS.
- Restricted elective subject elements, 22.5, 37.5 or 52.5 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 30, 45 or 60 ECTS.

### Compulsory subject elements

The following subject elements are to be covered (22.5 ECTS):

• NBIK14008U	Marine Biology	Block 1	15 ECTS
• NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS

### Restricted elective subject elements

22.5, 37.5 or 52.5 ECTS are to be covered by subject elements from the following list:

• Restricted elective subject elements offered as part of the specialisation in “Ecology” in this curriculum (see above)			
• NBIK14005U	The Biology of Fish	Block 2	7.5 ECTS
• NBIK14009U	Protists – Eukaryotic Microbiology	Block 2	7.5 ECTS
• NNMK15004U	Animal Morphology (from Sea Sponges to Vertebrates)	Block 4	7.5 ECTS
• NBIA05050U	Makrofauna i ferskvand: Økologi og miljøbedømmelse	Discontinued*	7.5 ECTS
• NBIA04100U	Marin faunistik: Marine fisks og invertebraters diversitet og biologi	Discontinued*	7.5 ECTS
• NBIA08032U	Marinbiologisk sommerkursus	Discontinued*	7.5 ECTS
• NBIA09032U	Biological Research Project within the field of aquatic biology	Discontinued*	7.5 ECTS
• NNMK14011U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### *5.1.5 Molecular Biology and Genetics*

#### Structure of the programme

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

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

#### Compulsory subject elements

The following subject elements are to be covered (30 ECTS):

• NBIA04008U	Molecular Genetics (Bachelor level)	Discontinued*	15 ECTS
• NBIB13012U	Epigenetics and Cell Differentiation (Bachelor level)	Discontinued*	7.5 ECTS
• NBIK13005U	Experimental Higher Model Organisms	Block 2	7.5 ECTS

\* See course specific changes below.

#### Restricted elective subject elements

15, 30 or 45 ECTS are to be covered by subject elements from the following list:

• Restricted elective subject elements offered as part of the specialisation in “Molecular Biology and			
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Genetics” in this curriculum (see above)			
• NBIB10009U	Gene Technology (Bachelor level)	Block 1	15 ECTS
• NBIA05008U	Biological Sequence Analysis	Block 1	7.5 ECTS
• NBIB14019U	Immunology (Bachelor level)	Block 2	15 ECTS
• NFYK14039U	Radioactive Isotopes and Ionizing Radiation	Block 3	7.5 ECTS
• NBIA09032U	Biological Research Project within the field of molecular biology and genetics	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### 5.1.6 Cell Biology and Physiology

#### Structure of the programme

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

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

#### Compulsory subject elements

The following subject elements are to be covered (30 ECTS):

• NBIK10018U	Cell Biology	Discontinued*	15 ECTS
• NBIK14014U	Cellular and Integrative Physiology	Block 3	15 ECTS

#### Restricted elective subject elements

15, 30 or 45 ECTS are to be covered by 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)			
• NBIA09032U	Biological Research Project within the field of Cell Biology and Physiology	Discontinued*	7.5 ECTS
• NBIK12011U	Ion Transport in Cancer	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### 5.1.7 Microbiology

#### Structure of the programme

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

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

#### Compulsory subject elements

The following subject element is to be covered (15 ECTS):

• NBIA04055U	Advanced Bacteriology	Discontinued*	15 ECTS
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\* See course specific changes below.

#### Restricted elective subject elements

30, 45 or 60 ECTS are to be covered by subject elements from the following list:

<ul style="list-style-type: none"> <li>• Restricted elective subject elements offered as part of the specialisation in “Microbiology” in this curriculum (see above)</li> </ul>			
• NBIK14011U	Microbial Biotechnology	Discontinued*	7.5 ECTS
• NBIA09032U	Biological Research Project within the field of Microbiology	Discontinued*	7.5 ECTS
• NBIA09041U	Emerging Molecular Techniques in Microbiology	Discontinued*	7.5 ECTS
• NBIA09049U	Microbial Ecology	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### 5.1.8 Marine Biology

#### Structure of the programme

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

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

#### Restricted elective subject elements

30, 45 or 60 ECTS are to be covered by subject elements from the following list:

<ul style="list-style-type: none"> <li>• Restricted elective subject elements offered as part of the specialisation in “Marine Biology” in this curriculum (see above)</li> </ul>			
• NBIK10025U	Experimental Marine Biology	Discontinued*	7.5 ECTS
• NBIA08032U	Marinbiologisk sommerkursus	Discontinued*	7.5 ECTS
• NBIA09032U	Biological Research Project within the field of marine biology	Discontinued*	7.5 ECTS
• NBIA04100U	Marin faunistik: Marine fisks og invertebraters diversitet og biologi	Discontinued*	7.5 ECTS
• NNMK14011U	Animal Morphology (from Sea Sponges to Vertebrates)	Discontinued*	7.5 ECTS
• NBIK14002U	Ecophysiology of Brackish Water Invertebrates	Discontinued*	7.5 ECTS
• NPLK17002U	Applied Phycology	Discontinued*	7.5 ECTS

\* See course specific changes below.

### Thesis

Disregarding of the chosen specialisation students admitted in the academic year 2014/15 or earlier can freely choose a thesis corresponding to 30, 45 or 60 ECTS.

### 6 Course specific changes

Discontinued course	Interim arrangement
Advanced Bacteriology (NBIA04055U), 15 ECTS	<p>The course was a restricted elective course on “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>In this curriculum, Advanced Bacteriology 1 (NBIK15003U), 7.5 ECTS + Advanced Bacteriology 2 (NBIK15005U), 7.5 ECTS replaces the course.</p>
Advanced Fungal Identification (NBIK13013U),	<p>The course was a restricted elective course on the specialisation “Ecology and Evolution” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third</p>

7.5 ECTS	<p>exam is offered in the academic year 2015/16.</p> <p>In this curriculum, Field Mycology and Identification of Fungi (NNMK14010U), 7.5 ECTS replaces the course.</p>
<p>Animal Morphology (from Sea Sponges to Vertebrates) (NNMK14011U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the “General Profile in Biology” and the specialisation in “Ecology and Evolution”, “Aquatic Biology” and “Marine Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course is unchanged except for the institute affiliation and the course code and in this curriculum, Animal Morphology (from Sea Sponges to Vertebrates) (NNMK15004U), 7.5 ECTS replaces the course.</p>
<p>Applied Phycology (NPLK17002U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in “Marine Biology” in the academic year 2018/19 or earlier.</p> <p>The course was offered for the last time in the academic year 2018/19 and a third exam is offered in the academic year 2019/20.</p>
<p>Arctic Field Course (NBIK14024U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in “Ecology” and “Marine Biology” in the academic year 2017/18 or earlier.</p> <p>The course was offered for the last time in the academic year 2017/18.</p> <p>The course has changed title and is identical “Arctic Biology Field Course” (NBIK18001U), 7.5 ECTS.</p>
<p>Basic Parasitology (LBIK10199U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in “Microbiology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>In this curriculum, Basic Parasitology (NPLK15000U), 7.5 ECTS replaces the course.</p>
<p>Biological Dynamics (NBIK14012U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisations in “Molecular Biology and Genetics” and “Microbiology” in the academic year 2015/16 and 2016/17 and on the “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2016/17.</p> <p>The course is identical to “Dynamical Models in Molecular Biology” (NBIK17001U), 7.5 ECTS.</p>
<p>Biological Research Project (NBIA09032U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the “General Profile in Biology” and all of the specialisations in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course is replaced by the possibility of doing a “Project Outside the Course Scope” (NFKK14001U), 7.5 ECTS.</p>
<p>Cell Biology (NBIK10018U), 15 ECTS</p>	<p>The course was a restricted elective course on the general profile and compulsory on the specialisation in “Cell Biology and Physiology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16. (A last exam was offered June</p>



	<p>22<sup>nd</sup> 2015.)</p> <p>In this curriculum, the combination of: 1) Advanced Cell Biology (NBIK15006U), 7.5 ECTS and 2) Cellular Signaling in Health and Disease (NBIK15009U), 7.5 ECTS replaces the course.</p>
<p>Conservation Management of Protected Natural and Semi-natural Habitats (NIGK15003U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in “Ecology” in the academic year 2016/17.</p> <p>The course was offered for the last time in the academic year 2017/18 and a third exam is offered in the academic year 2018/19.</p>
<p>“Danske naturtyper, økologi og karakteristik” (NBIA04058U)</p>	<p>The course was a restricted elective course on the specialisation “Ecology” in the academic year 2016/17 and 2015/16 and on the specialisations “General Profile in Biology” and “Terrestrial Ecology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2016/17 and a third exam is offered in the academic year 2017/18.</p>
<p>Ecosystem Ecology (NBIK14000U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in Ecology in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2015/16.</p> <p>The course has changed title and is identical “Applied Ecosystem Ecology” (NIGK16000U), 7.5 ECTS.</p>
<p>Ecophysiology of Brackish Water Invertebrates (NBIK14002U)</p>	<p>The course was a restricted elective course on the specialisations in “Marine Biology” in the academic year 2016/17 or earlier and in “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2016/17 and a third exam is offered in the academic year 2017/18.</p>
<p>Emerging Molecular Techniques in Microbiology (NBIA09041U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in Microbiology in the academic year 2015/16 and in the specialisation in General profile of Biology in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p> <p>In this curriculum, Human Microbiome – Experiments (NBIK16000U), 7.5 ECTS replaces the course.</p>
<p>Entomology (MSc level) (NNMK14009U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation “Ecology and Evolution” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course has changed from master’s level to bachelor’s level and in this curriculum, Entomologi (NNMB15000U), 7.5 ECTS replaces the course.</p>
<p>Epigenetics and Cell Differentiation (BSc level) (NBIB13012U), 7.5 ECTS</p>	<p>The course was a compulsory course at the specialisation in “Molecular Biology in the academic year 2015/16 and Genetics” and a restricted elective course on “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course has changed from bachelor’s level to master’s level and in this curriculum, Epigenetics and Cell Differentiation (NBIK15010U), 7.5 ECTS replaces the course.</p>

Evolutionary Ecology (NBIA04061U), 7.5 ECTS	<p>The course was a compulsory course at the specialisation in “Ecology and Evolution” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2013/14 and a third exam is offered in the academic year 2014/15.</p> <p>The course is identical with the course Evolutionary Ecology (NBIK14021U), 7.5 ECTS.</p>
Evolution and Ancient DNA: Practice and Theory (NBIA07032U), 7.5 ECTS	<p>The course was a restricted elective course on the specialisation in “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p>
Experimental Marine Biology (NBIK10025U), 7.5 ECTS	<p>The course was a restricted elective course on the specialisation Marine Biology in the academic year 2015/16 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p>
Feltkursus i naturforvaltning (NBIA08029U), 7.5 ECTS	<p>The course was a restricted elective course on the specialisation in “Ecology” in the academic year 2015/16-2016/17 and in “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2017/18.</p> <p>The course is identical with the course Feltkursus i naturforvaltning (NIGK17018U), 7.5 ECTS.</p>
Freshwater ecology (NBIK15012U), 15 ECTS	<p>The course was a restricted elective course on the specialisation in Ecology in the academic year 2015/16.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p>
Ion Transport in Cancer (NBIK12011U), 7.5 ECTS	<p>The course was a restricted elective course on the specialisation in “Cell Biology and Physiology” in the academic year 2015/16-2016/17 and in “General Profile in Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2017/18.</p>
Macro Ecology (NBIK13006U), 7.5 ECTS	<p>The course was compulsory on the specialisation in Ecology and Evolution and restricted elective on the general profile in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>In this curriculum, Macroecology and Community Ecology (NBIK15015U), 7.5 ECTS replaces the course.</p>
Macro Fauna in Freshwater: Ecology and Environmental Assessment (NBIK15023U), 7.5 ECTS	<p>The course was compulsory on the specialisation in Ecology and Evolution and restricted elective on the general profile in the academic year 2015/16.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p> <p>The course has changed language and is identical with Makrofauna i ferskvand: Økologi og Miljøbestemmelse (NBIA05050U), 7.5 ECTS.</p> <p>In this curriculum, Freshwater Ecology (NBIK14004U), 7.5 ECTS replaces the course.</p>
Makrofauna i	The course was a restricted elective course on the specialisations in “Cell

ferskvand: Økologi og Miljøbestemmelse (NBIA05050U)	<p>Biology and Physiology” and “Marine Biology” in the academic year 2015/16 and 2016/17 and on the specialisations in “General Profile in Biology” and “Aquatic Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2016/17 and a third exam is offered in the academic year 2017/18.</p>
Marinbiologisk sommerkursus (NBIA08032U), 7.5 ECTS	<p>The course was a restricted elective course on the general profile and on the specialisations in Aquatic Ecology and Marine Biology.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course has changed from master’s level to bachelor’s level and in this curriculum, Marinbiologisk sommerkursus (NBIB15001U), 7.5 ECTS replaces the course.</p>
Marin faunistik: Marine fisks og invertebraters diversitet og biologi (NBIA04100U), 7.5 ECTS	<p>The course was a restricted elective course on the specialisations “General Profile in Biology”, “Ecology and Evolution”, “Aquatic Biology” and “Marine Biology” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course has changed language from Danish to English and in this curriculum, Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates (NBIK15020U), 7.5 ECTS replaces the course.</p>
Marine Microbiology and Virology (NBIK12009U), 15 ECTS	<p>The course was a restricted elective course on the specialisation in “Microbiology” and “Marine Biology” in the academic year 2015/16 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p> <p>The course has changed from weighing 15 ECTS to weighing 7.5 ECTS. The name is unchanged Marine Microbiology and Virology (NBIK16003U), but the course is half the size and can therefore not replace the 15 ECTS course.</p>
Microbial Biotechnology (NBIK14011U), 7.5 ECTS	<p>The course was a restricted elective course on the General Profile and on the specialisation in Microbiology.</p> <p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course has changed from master’s level to bachelor’s level and in this curriculum, Microbioal Biotechnology (NBIB15008U), 7.5 ECTS replaces the course.</p>
Microbial Ecology (NBIA09049U), 7.5 ECTS	<p>The course was compulsory at the specialisation in “Terrestrial Ecology” in the academic year 2014/15 or earlier. The course was a restricted elective course on the specialisation in “Microbiology” and “Ecology” in the academic year 2015/16 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p> <p>The course has changed from master’s level to bachelor’s level and language from English to Danish. In this curriculum, Mikrobiel Økologi (NBIB16003U), 7.5 ECTS replaces the course. If the student has not passed the course Microbial Ecology (NBIA09049U) they must follow the Danish course.</p>

<p>Molecular Genetics (NBIA04008U), 15 ECTS</p>	<p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>In this curriculum Theoretical Molecular Genetics (NBIK15017U), 7.5 ECTS + Experimental Molecular Genetics (NBIK15011U), 7.5 ECTS replaces the course.</p> <p>The course was a compulsory course at the specialisation in Molecular Biology and Genetics and a restricted elective course on the general profile.</p>
<p>Mycology (NBIK13016U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation in “Microbiology” and “Ecology” in the academic year 2015/16.</p> <p>The course was offered for the last time in the academic year 2017/18.</p> <p>The course has changed title and is identical “Fungal Biology” (NBIK18000U), 7.5 ECTS.</p>
<p>Phylogenetic and Molecular Methods (NNMK14012U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation “General Profile in Biology” in the academic year 2015/16 or earlier.</p> <p>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</p>
<p>Videregående Naturfagsdidaktik (NNDK13000U), 7.5 ECTS</p>	<p>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</p> <p>The course was a restricted elective course on the general profile and in this curriculum, Naturfagsdidaktik for Biologi (DidBio) (NNDK15000U), 7.5 ECTS replaces the course.</p>
<p>Videregående plantebestemmelse (NBIK13001U), 7.5 ECTS</p>	<p>The course was a restricted elective course on the specialisation “Ecology” in the academic year 2016/17 and 2015/16 and on the specialisations “General Profile in Biology” and “Ecology and Evolution” in the academic year 2014/15 or earlier.</p> <p>The course was offered for the last time in the academic year 2016/17 and a third exam is offered in the academic year 2017/18.</p>

## 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.