Programme-specific Section of the
Curriculum for the MSc Programme in
Biology
at the Faculty of Science, University of Copenhagen
2012 (Rev. 2020)

Contents

1 Title, affiliation and language ................................................................. 2
   1.1 Title .................................................................................................. 2
   1.2 Affiliation ....................................................................................... 2
   1.3 Corps of external examiners ............................................................ 2
   1.4 Language ....................................................................................... 2

2 Academic profile ................................................................................... 2
   2.1 Purpose ......................................................................................... 2
   2.2 General programme profile .......................................................... 3
   2.3 General structure of the programme .............................................. 3
   2.4 Career opportunities ...................................................................... 3

3 Description of competence profiles .................................................... 3
   3.1 Generic competence profile .......................................................... 3
   3.2 Molecular Biology and Genetics ................................................... 4
   3.3 Cell Biology and Physiology ........................................................ 4
   3.4 Microbiology ................................................................................ 5
   3.5 Ecology ......................................................................................... 6
   3.6 Marine Biology ............................................................................. 6

4 Admission requirements ..................................................................... 7
   4.1 Applicants with a Bachelor’s degree in Biology from the University of Copenhagen ................................................................. 7
   4.2 Applicants with a Bachelor’s degree in Biology ................................ 7
   4.3 Applicants with a related Bachelor’s degree .................................. 7
   4.4 Other applicants .......................................................................... 7
   4.5 Language requirements ................................................................ 7
   4.6 Supplementary subject elements ................................................ 7

5 Prioritisation of applicants ................................................................ 8

6 Structure of the programme .............................................................. 8
   6.1 Molecular Biology and Genetics ................................................... 9
   6.2 Cell Biology and Physiology ........................................................ 10
   6.3 Microbiology ................................................................................ 12
   6.4 Ecology ........................................................................................ 13
   6.5 Marine Biology ............................................................................ 15

7 Exemptions .......................................................................................... 16

8 Commencement etc. .......................................................................... 17
   8.1 Validity ......................................................................................... 17
   8.2 Transfer ....................................................................................... 17
   8.3 Amendments ................................................................................ 17

Appendix 1 Tables ................................................................................. 18

Appendix 2 Interim arrangements ........................................................ 21
   Structure of the programme .............................................................. 22
   Structure of the programme .............................................................. 26
   Structure of the programme .............................................................. 30

Appendix 3 Description of objectives for the thesis ............................. 35
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 molekylerbiologi 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, 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.
- 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 in time to begin the MSc Programme within three years of 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.

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 with reserved access to the 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
- 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.

Thesis preparation projects may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 6 to the shared section of the curriculum.
Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 45 ECTS of the programme.

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 1st 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 1st 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, 15 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

6.2.1 Compulsory subject elements
The following subject elements are to be covered (15 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:
- 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
- NBIK20006U Advanced Topics in Physiology 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.

Thesis preparation projects may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 6 to the shared section of the curriculum.

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 45 ECTS of the programme.

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 1st 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 1st year.

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

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

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK15003U</td>
<td>Advanced Bacteriology 1</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK15005U</td>
<td>Advanced Bacteriology 2</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK15016U</td>
<td>The Human Microbiome</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NPLK15000U</td>
<td>Basic Parasitology</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIA05008U</td>
<td>Biological Sequence Analysis</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>LBIK10180U</td>
<td>Applied Microbiology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14009U</td>
<td>Protists – Eucaryotic Microbiology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK17001U</td>
<td>Dynamical Models in Molecular Biology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>SBIK10200U</td>
<td>Human Parasitology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>SBIK10182U</td>
<td>From Gene to Function in Pathogenic Bacteria</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14035U</td>
<td>Medical Bacteriology</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK16003U</td>
<td>Marine Microbiology and Virology</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIA08004U</td>
<td>Evolutionary Medicine</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIA09043U</td>
<td>Population Genetics</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14016U</td>
<td>Experimental Design and Statistical Methods in Biology (StatBio)</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK16000U</td>
<td>The Human Microbiome - Experiments</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIA07023U</td>
<td>Bioinformatics of High Throughput Analyses</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NFKK14001U</td>
<td>Project outside the course scope</td>
<td>Block 1-5</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NFKK14006U</td>
<td>Project in practice</td>
<td>Block 1-5</td>
<td>15 ECTS</td>
</tr>
</tbody>
</table>

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.
Thesis preparation projects may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 6 to the shared section of the curriculum.

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 45 ECTS of the programme.

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 1st 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 1st 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):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK15007U</td>
<td>Advanced Ecology</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK14021U</td>
<td>Evolutionary Ecology</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NPLK15000U</td>
<td>Basic Parasitology</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK15018U</td>
<td>Danish Natural Habitats, Ecology and Characterisation</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NNMK14010U</td>
<td>Field Mycology and Identification of Fungi</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>LNAK10099U</td>
<td>Biodiversity in Urban Nature</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK15015U</td>
<td>Macroecology and Community Ecology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14022U</td>
<td>Methodology and Sampling in Environmental Management</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14007U</td>
<td>Soil Biology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14001U</td>
<td>Climate Change and Biogeochemical Cycles</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Block</td>
<td>ECTS</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>NBIK14009U</td>
<td>Protists – Eukaryotic Microbiology</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK12003U</td>
<td>Conservation Biology</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK14010U</td>
<td>Social Behaviour and Communication</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIA09043U</td>
<td>Population Genetics</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NNMK11002U</td>
<td>Ornithology</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK14016U</td>
<td>Experimental Design and Statistical Methods in Biology (StatBio)</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NIGK16000U</td>
<td>Applied Ecosystem Ecology</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NIGK14002U</td>
<td>Geographical Information Systems (GIS)</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK15019U</td>
<td>Sensory Biology</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK14018U</td>
<td>Terrestrial Ecosystem Processes and Global Change</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NNMK15004U</td>
<td>Animal Morphology (from Sea Sponges to Vertebrates)</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK14017U</td>
<td>Invasion Biology</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK14013U</td>
<td>Arctic Biology</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK14004U</td>
<td>Freshwater Ecology</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>LNAK10010U</td>
<td>Environmental Impact Assessment</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NNMK15003U</td>
<td>Climate Change and Biodiversity</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NIGK14008U</td>
<td>VVM i praksis</td>
<td>Block 4</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK18001U</td>
<td>Arctic Biology Field Course</td>
<td>Block 5</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK15000U</td>
<td>Advanced Plant Identification</td>
<td>Block 5</td>
<td>7.5</td>
</tr>
<tr>
<td>NBIK15020U</td>
<td>Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates</td>
<td>Block 5</td>
<td>7.5</td>
</tr>
<tr>
<td>NFKK14001U</td>
<td>Project outside the course scope</td>
<td>Block 1-5</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NFKK14006U</td>
<td>Project in practice</td>
<td>Block 1-5</td>
<td>15 ECTS</td>
</tr>
</tbody>
</table>

### 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.

Thesis preparation projects may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 6 to the shared section of the curriculum.

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 45 ECTS of the programme.
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 1st 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 1st 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):

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK14008U</td>
<td>Marine Biology</td>
<td>Block 1</td>
<td>15 ECTS</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK14009U</td>
<td>Protists - Eukaryotic Microbiology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14005U</td>
<td>The Biology of Fish</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14022U</td>
<td>Methodology and Sampling in Environmental Management</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK16003U</td>
<td>Marine Microbiology and Virology</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK15019U</td>
<td>Sensory Biology</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14016U</td>
<td>Experimental Design and Statistical Methods in Biology (StatBio)</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NNIK15004U</td>
<td>Animal Morphology (from Sea Sponges to Vertebrates)</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14013U</td>
<td>Arctic Biology</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK14004U</td>
<td>Freshwater Ecology</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NIGK14008U</td>
<td>VVM i praksis</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>LNAK10010U</td>
<td>Environmental Impact Assessment</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK15020U</td>
<td>Marine Faunistics: Biology and Systematics of Marine Fish and Invertebrates</td>
<td>Block 5</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NBIK18001U</td>
<td>Arctic Biology Field Course</td>
<td>Block 5</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NFKK14001U</td>
<td>Project outside the course scope</td>
<td>Block 1-5</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NFKK14006U</td>
<td>Project in Practice</td>
<td>Block 1-5</td>
<td>15 ECTS</td>
</tr>
</tbody>
</table>
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.

Thesis preparation projects may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 6 to the shared section of the curriculum.

Projects outside the course scope, projects in practice and thesis preparation projects may not exceed 45 ECTS of the programme.

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 1st 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 1st year.

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

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

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

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

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

8.3 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 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

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Theoretical Molecular Genetics</td>
<td>Experimental Higher Model Organisms</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compulsory: [gray box]  Restricted elective: [light gray box]  Elective: [white box]

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

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Advanced Cell Biology</td>
<td>Restricted elective</td>
<td>Cellular and Integrative Physiology</td>
<td>Elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compulsory: [gray box]  Restricted elective: [light gray box]  Elective: [white box]

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

Table – Microbiology

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Advanced Bacteriology 1</td>
<td>Advanced Bacteriology 2</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compulsory: [gray box]  Restricted elective: [light gray box]  Elective: [white box]

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

Table – Ecology

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Advanced Ecology</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compulsory: [gray box]  Restricted elective: [light gray box]  Elective: [white box]

The table illustrates the recommended academic progression. The student is allowed to plan an alternative progression within the applicable rules.
### Table – Marine Biology

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Biology</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td></td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 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*

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Theoretical Molecular Genetics</td>
<td>Experimental Higher Model Organisms</td>
<td></td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td>Elective</td>
<td></td>
</tr>
</tbody>
</table>

| 2nd year | Thesis |

| Compulsory | Restricted elective | Elective |

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

### Table – Cell Biology and Physiology*

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellular and Integrative Physiology</td>
<td>Restricted elective</td>
<td>Advanced Cell Biology</td>
<td>Restricted elective</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td></td>
</tr>
</tbody>
</table>

| 2nd year | Thesis |

| Compulsory | Restricted elective | Elective |

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

### Table – Microbiology*

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Advanced Bacteriology 1</td>
<td>Advanced Bacteriology 2</td>
<td></td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Elective</td>
<td>Elective</td>
<td></td>
</tr>
</tbody>
</table>

| 2nd year | Thesis |

| Compulsory | Restricted elective | Elective |

*This table is only relevant for students who begin the MSc Programme in February (block 3)
### Table – Ecology*

<table>
<thead>
<tr>
<th></th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st year</strong></td>
<td>Elective</td>
<td>Elective</td>
<td>Advanced Ecology</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
</tbody>
</table>

**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*

<table>
<thead>
<tr>
<th></th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st year</strong></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Marine Biology</td>
<td>Elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td></td>
<td>Elective</td>
</tr>
</tbody>
</table>

**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 2019/2020

Students admitted to the MSc Programme in the academic year 2019/20 must finish the programme as listed in the curriculum above with the following exceptions.

1.1 Molecular Biology and Genetics

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

<table>
<thead>
<tr>
<th>1st year</th>
<th>2nd year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td>Block 2</td>
</tr>
<tr>
<td>Theoretical Molecular Genetics</td>
<td>Experimental Higher Model Organisms</td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
</tr>
</tbody>
</table>

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

*This table only applies to students who start the thesis before 20 August 2020.

Table – Molecular Biology and Genetics - students admitted in February*

<table>
<thead>
<tr>
<th>1st year</th>
<th>2nd year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 3</td>
<td>Block 4</td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
</tr>
</tbody>
</table>

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

*This table only applies to students who start the thesis before 20 August 2020.
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)

| NBIK14020U | Archaea Biology | Discontinued* | 7.5 ECTS |

* See course specific changes below.

1.2 Cell Biology and Physiology

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

Table – Cell Biology and Physiology - students admitted in September*

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Advanced Cell Biology</td>
<td>Restricted elective</td>
<td>Cellular and Integrative Physiology</td>
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<td>Restricted elective</td>
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<td>Thesis</td>
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</table>

Subject elements in italics have been discontinued. See course specific changes below.

Table – Cell Biology and Physiology* - students admitted in February*

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Cellular and Integrative Physiology</td>
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*This table is only relevant for students who begin the MSc Programme in February (block 3)
Subject elements in italics have been discontinued. See course specific changes below.
1.3 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 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

Table – Microbiology - students admitted in September*

<table>
<thead>
<tr>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
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<td>2nd year</td>
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<td>Elective</td>
<td>Thesis</td>
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</tbody>
</table>

*This table only applies to students who start the thesis before 20 August 2020.

Table – Microbiology - students admitted in February*

<table>
<thead>
<tr>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
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<td>Restricted elective</td>
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<tr>
<td>2nd year</td>
<td>Elective</td>
<td>Elective</td>
<td>Thesis</td>
</tr>
</tbody>
</table>

*This table only applies to students who start the thesis before 20 August 2020.

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)
- NBIK14020U Archaea Biology Discontinued* 7.5 ECTS
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) Discontinued* 7.5 ECTS

* See course specific changes below.
1.4 Ecology

Structure of the programme
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 in September*

<table>
<thead>
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<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
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Table – Ecology – students admitted in February*

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<th>Block 2</th>
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<td>Restricted elective</td>
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*See course specific changes below.

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)
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) | Discontinued* | 7.5 ECTS

* See course specific changes below.

1.5 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)
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) | Discontinued* | 7.5 ECTS

* See course specific changes below.
2 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.

2.1 Molecular Biology and Genetics
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 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

Table – Molecular Biology and Genetics - students admitted in September*

<table>
<thead>
<tr>
<th>1st year</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
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<td>Restricted elective</td>
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| 2nd year | Elective | Elective | Thesis | |

Table – Molecular Biology and Genetics - students admitted in February*

<table>
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<th>Block 1</th>
<th>Block 2</th>
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<td>Thesis</td>
<td></td>
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</tbody>
</table>

| 2nd year | Elective | Elective | Thesis | |

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)
- NBIK14020U | Archaea Biology | Discontinued* | 7.5 ECTS

* See course specific changes below.
2.2 Cell Biology and Physiology

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

Table – Cell Biology and Physiology - students admitted in September*

<table>
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<tr>
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<th>Block 3</th>
<th>Block 4</th>
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</thead>
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Subject elements in italics have been discontinued. See course specific changes below.

Table – Cell Biology and Physiology* - students admitted in February*

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<th>Block 1</th>
<th>Block 2</th>
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<td>2nd year</td>
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Subject elements in italics have been discontinued. See course specific changes below.

*This table is only relevant for students who begin the MSc Programme in February (block 3)
2.3 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 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.

### Table – Microbiology - students admitted in September*

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<tr>
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</tr>
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<tbody>
<tr>
<td>Advanced Bacteriology 1</td>
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<tbody>
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<td>Thesis</td>
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</table>

*This table only applies to students who start the thesis before 20 August 2020.

### Table – Microbiology - students admitted in February*

<table>
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<tbody>
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</thead>
<tbody>
<tr>
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<td>Elective</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

*This table only applies to students who start the thesis before 20 August 2020.

### 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)
- NBIK14020U Archaea Biology Discontinued* 7.5 ECTS
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) Discontinued* 7.5 ECTS

* See course specific changes below.
2.4 Ecology
Structure of the programme
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 in September*

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<tr>
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<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>year</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
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<td>Thesis</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

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 only applies to students who start the thesis before 20 August 2020.

Table – Ecology – students admitted in February*

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<th>Block 3</th>
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<th>Block 1</th>
<th>Block 2</th>
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<td>Restricted elective</td>
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<tr>
<td>year</td>
<td>Restricted elective</td>
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<td>Thesis</td>
</tr>
<tr>
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<td>Restricted elective</td>
<td>Restricted elective</td>
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</tr>
<tr>
<td>2nd</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Thesis</td>
<td></td>
</tr>
</tbody>
</table>

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 only applies to students who start the thesis before 20 August 2020.

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)
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) Discontinued* 7.5 ECTS

* See course specific changes below.

2.5 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
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) Discontinued* 7.5 ECTS

* See course specific changes below.
3 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.

3.1 Molecular Biology and Genetics

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

Table – Molecular Biology and Genetics - students admitted in September*

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
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<td>Restricted elective</td>
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<td>Genetics</td>
<td>Model Organisms</td>
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<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Thesis</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>Elective</td>
<td>Elective</td>
<td></td>
<td>Thesis</td>
</tr>
</tbody>
</table>

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 only applies to students who start the thesis before 20 August 2020.

Table – Molecular Biology and Genetics - students admitted in February*

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<th>Block 3</th>
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<td>Elective</td>
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<td>Thesis</td>
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</table>

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 only applies to students who start the thesis before 20 August 2020.

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)
- NBIK14020U  Archaea Biology  Discontinued*  7.5 ECTS

* See course specific changes below.
3.2 Cell Biology and Physiology

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

Table – Cell Biology and Physiology - students admitted in September*

<table>
<thead>
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<tbody>
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2nd year

Thesis

Subject elements in italics have been discontinued. See course specific changes below.

Table – Cell Biology and Physiology* - students admitted in February*

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<th>Block 2</th>
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</thead>
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2nd year

Thesis

Subject elements in italics have been discontinued. See course specific changes below.

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

3.3 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 ECTS.
- Elective subject elements, 15 ECTS.
- Thesis, 60 ECTS.
### Table – Microbiology - students admitted in September*

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*This table only applies to students who start the thesis before 20 August 2020.

### Table – Microbiology - students admitted in February*

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<td>Restricted elective</td>
<td>Advanced Bacteriology 1</td>
<td>Advanced Bacteriology 2</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td></td>
<td>Thesis</td>
</tr>
<tr>
<td>2nd year</td>
<td>Elective</td>
<td>Elective</td>
<td></td>
<td>Thesis</td>
</tr>
</tbody>
</table>

*This table only applies to students who start the thesis before 20 August 2020.
 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)
- NBIK14020U Archaea Biology Discontinued* 7.5 ECTS
- NNMK17004U Introduction to Ecological Data Analysis with R (REcoStat) Discontinued* 7.5 ECTS

* See course specific changes below.

3.4 Ecology
Structure of the programme
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 in September*

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Advanced Ecology</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Thesis</td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>Elective</td>
<td>Elective</td>
<td></td>
<td>Thesis</td>
</tr>
</tbody>
</table>

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 only applies to students who start the thesis before 20 August 2020.

Table – Ecology – students admitted in February*

<table>
<thead>
<tr>
<th></th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Elective</td>
<td>Elective</td>
<td>Advanced Ecology</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Thesis</td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td></td>
<td>Thesis</td>
</tr>
</tbody>
</table>

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 only applies to students who start the thesis before 20 August 2020.
**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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Status</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK14024U</td>
<td>Arctic Field Course</td>
<td>Discontinued*</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NNMK17004U</td>
<td>Introduction to Ecological Data Analysis with R (REcoStat)</td>
<td>Discontinued*</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>

* See course specific changes below.

**3.5 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)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Status</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBIK14024U</td>
<td>Arctic Field Course</td>
<td>Discontinued*</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NPLK17002U</td>
<td>Applied Phycology</td>
<td>Discontinued*</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NNMK17004U</td>
<td>Introduction to Ecological Data Analysis with R (REcoStat)</td>
<td>Discontinued*</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>

* See course specific changes below.
## 4 Course specific changes

<table>
<thead>
<tr>
<th>Discontinued course</th>
<th>Interim arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Phycology (NPLK17002U), 7.5 ECTS</td>
<td>The course was a restricted elective course on the specialisation in Marine Biology in the academic year 2018/19 and 2017/18.</td>
</tr>
<tr>
<td></td>
<td>Offered for the last time: 2018/19</td>
</tr>
<tr>
<td></td>
<td>Last exam if applicable (cf. SCIENCe’s Teaching and exam rules): 2019/20.</td>
</tr>
<tr>
<td>Archaea Biology (NBIK14020U), 7.5 ECTS</td>
<td>The course was a restricted elective course on the specialisation in Molecular Biology and Genetics in the academic year</td>
</tr>
<tr>
<td></td>
<td>Offered for the last time: 2019/20</td>
</tr>
<tr>
<td></td>
<td>Last exam if applicable (cf. SCIENCe’s Teaching and exam rules): 2020/21.</td>
</tr>
<tr>
<td>Arctic Field Course (NBIK14024U), 7.5 ECTS</td>
<td>The course was a restricted elective course on the specialisation in Ecology and Marine Biology in the academic year 2017/18 or earlier.</td>
</tr>
<tr>
<td></td>
<td>Offered for the last time: 2017/18.</td>
</tr>
<tr>
<td></td>
<td>The course has changed title and is identical “Arctic Biology Field Course” (NBIK18001U), 7.5 ECTS.</td>
</tr>
<tr>
<td>Cellular and Integrative Physiology (NBIK14014U), 15 ECTS</td>
<td>The course was compulsory on the specialisation in Cell Biology and Physiology in the academic year 2019/20, 2018/19 and 2017/18.</td>
</tr>
<tr>
<td></td>
<td>Offered for the last time: 2019/20</td>
</tr>
<tr>
<td></td>
<td>In this curriculum Cellular and Integrative Physiology (NBIK20005U), 7.5 ECTS and Advanced Topics in Physiology (NBIK20006U), 7.5 ECTS replaces the course.</td>
</tr>
<tr>
<td>Introduction to Ecological Data Analysis with R (REcoStat) (NNMK17004U)</td>
<td>The course was a restricted elective course on the specialisation in Microbiology, Ecology and Marine Biology in the academic year 2019/20, 2018/19 and 2017/18.</td>
</tr>
<tr>
<td></td>
<td>Offered for the last time: 2019/20.</td>
</tr>
<tr>
<td></td>
<td>Last exam if applicable (cf. SCIENCe's Teaching and exam rules): 2020/21.</td>
</tr>
</tbody>
</table>
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.