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

2012 (Rev. 2025)

Contents

1 Title, affiliation and language

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

1.1 Title

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

1.2 Affiliation

The programme is affiliated with the Study Board of Natural Resources, Environment and Animal Science, and the students can both elect, and be elected, to this study board.

1.3 Corps of external examiners

The following corps of external examiners is used for the central parts of the MSc Programme:

- Corps of External Examiners for Agricultural Science (*jordbrugsvidenskab*).

1.4 Language

The language of this MSc Programme is English.

2 Academic profile

2.1 Purpose

The programme aims to empower natural science graduates with the skills to monitor, analyze, manage and regulate both human-impacted and naturally perturbed terrestrial, aquatic, and atmospheric environments. The programme provides the foundation that graduates may also choose to pursue a research career. Graduates will be equipped with knowledge and tools to develop innovative and sustainable solutions that address global environmental challenges such as pollution, clean water scarcity, increased demand for access to high-quality soils, biodiversity loss, deforestation and climate change.
This comprehensive programme covers all types of pollutants, their distribution, toxicity, and fate, as well as their impact on the environment and human health. By fostering a deep, quantitative understanding of environmental processes, the programme supports sustainable decision-making and promotes solution-oriented thinking within the field of environmental sciences.

2.2 General programme profile

The programme is rooted in natural science, with a strong emphasis on hands-on experimental laboratory and field work. Experimental and field work significantly enhances the learning experience in this programme by providing students with practical, hands-on opportunities to apply theoretical knowledge in real-world settings. Here are a few key benefits: i) Students can directly observe and analyze environmental processes and human impacts, bridging the gap between classroom learning and real-world scenarios. ii) Essential skills such as experimental design, data collection, sampling techniques, and environmental monitoring, which are crucial for a career in environmental science, are trained. iii) Encountering and addressing real environmental challenges in the laboratory and in the field fosters critical thinking and problem-solving abilities.

At its core, the programme focuses on understanding biogeochemical and physical environmental processes, exploring how human activities may disrupt these processes, and examining the resulting impacts on human and ecosystem health.

This programme lays the foundation for cutting-edge environmental science research, sustainable environmental management, and the development of solutions to mitigate adverse effects. Students can specialize in one of two areas:

- Chemistry, Toxicology, and Health
- Soil and Water

The specialisation in Chemistry, Toxicology, and Health focusses on the sources, distribution, and fate of pollutants, as well as their effects on organisms and ecosystems. It also explores innovative solutions for monitoring and regulating pollutants, and for mitigating and remediating pollution. Taking a molecular approach, this specialization requires a solid foundation in chemistry and biology.

Students will engage in compulsory courses that cover the chemistry of pollutants across terrestrial, aquatic, and atmospheric environments; the toxicity of pollutants to humans and the environment at the organism level; and the impact of pollutants on populations assessed using environmental epidemiology tools.

The specialisation Chemistry, Toxicology and Health combines the individual disciplines: chemistry, biology including microbiology, (eco)toxicology and human health. The six compulsory courses provide the knowledge necessary to relate distribution and fate of pollutants in the environment to the actual and potential occurrence of harmful effects.
The core courses include: 'Toxicology and Ecotoxicology', 'Soil and Water Pollution: Concepts and Theory', 'Soil and Water Pollution: Experimental Assessment', 'Air Pollution and Health' and 'Environmental Epidemiology'. The core courses culminate in the final compulsory subject 'Environmental and Human Health Risk Assessment of Chemicals'. Here, students combine their learnings from previous courses to assess risks and understand the broader implications of pollutant exposure, creating coherence between the subject elements and insight in ethical and political considerations involved in modern regulation of environmental pollutants.

Compulsory courses equip students with the competencies needed for thorough exposure and impact analysis of pollutants, forming a robust foundation for developing innovative, sustainable solutions that align with global sustainability goals and reduce human impact on natural resources and climate.

The Soil and Water specialisation takes a comprehensive approach to tackling environmental challenges caused by human activities but focusing primarily on the health and sustainability of ecosystems, and the protection of vital soil and water resources. This specialisation blends knowledge of biogeochemical processes, pollutants, ecology, and environmental modelling, at the field- or watershed scale, to promote sustainable resource management and develop innovative solutions for ecosystem health and clean water security.

Key aspects of this specialisation include: i) Understanding and managing the impacts of pollutants on soil and water, ii) applying ecological and biogeochemical principles to real-world environmental issues, and iii) utilizing environmental modelling to predict and mitigate ecosystem impacts.

The Soil and Water specialisation integrates the disciplines of (biogeo)chemistry, ecology, hydrology, and modelling. At the heart of the programme are two compulsory courses: Soil and Water Pollution: Concepts and Theory' and 'Land Use and Environmental Modelling'. These courses provide essential knowledge on how geochemical and (micro)biological processes in soils influence the quality of surface water and groundwater formation.
This core is further enriched by restricted elective courses that focus on: Biogeochemistry and hydrology processes and dynamics from laboratory- to landscape scale; analytical methods

and techniques for studying soil and water; Plant-, freshwater-, and landscape ecology; ecotoxicology; data science, statistics, and modelling. Together, these compulsory and restricted elective courses equip students with the core competencies and knowledge to professionally engage in soil and water challenges. They also empower students to propose and implement environmental solutions for the sustainable and climate-friendly use of natural resources in both rural and urban areas.

2.3 General structure of the programme

The MSc Programme is set at 120 ECTS.

The MSc Programme in Environmental Science consists of the following elements:

- Specialisation: 120 ECTS, including the thesis.

The student must choose one of the following specialisations:

- Chemistry, Toxicology and Health
- Soil and Water

2.4 Career opportunities

The MSc Programme in Environmental Science qualifies students to become professionals within business, management and research functions and/or areas such as:

- A PhD programme or other research function within academia and research institutions.
- Research and communication within industries working with developing environmentally more benign products, improved waste handling, and more sustainable production processes.
- National and international advising, consultancy and project management within natural science and health science, with strong basis in environmental pollution, effects and impact, and solutions for environmental protection, ecosystem and human health.
- Clean-tech industries and related sectors developing new solutions and methodologies for cleaner technology and remediation technologies to clean air, soil and water.
- Public administration in municipalities all over the world working with monitoring, risk assessment and regulation of chemical and microbial pollutants and ecosystem management.
- Policy development, implementation and administration related to nature, environment and related technologies in the public sector (ministries and municipalities) and in private stakeholder organizations, including international NGOs.

3 Description of competence profiles

Students following the MSc Programme acquire the knowledge, skills and competencies listed below. Students will also acquire other qualifications through elective subject elements and other study activities.

3.1 Generic competence profile

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

<u>Knowledge about:</u>

- Environmental sustainability.
- Structure and function of ecosystems, including the effect of human activities on ecosystems.
- Pollutants, their properties, monitoring, origin, distribution and general fate.

- Properties of soil, water and air at the molecular/mechanistic and ecosystem level.
- Current solutions and mitigation goals for reducing pollutant impact.

Skills in/to:

- Select and master up-to-date methodologies for quantifying environmental load and sustainability of production systems.
- Analyse and evaluate scientific literature and assess possibilities and limitations in the application of theories, methods and new technologies on environmental science problems.
- Communicate complex information to a wide range of national as well as international audiences using modern and appropriate information and communication tools.
- Develop and use mathematical models describing biological, physical and chemical processes for predictive purposes and in relation to planning, management and evaluating performance of new solutions.
- Present deep insight in structure and functioning of natural and man-influenced rural and urban systems, environmental and health effects of ecosystem perturbations, and be able to develop environmental strategies, technologies and measures for achieving sustainable production systems.

Competences in/to:

- Assessment of environmental system sustainability e.g. risk assessment.
- Handle and solve complex environmental challenges in specific work situations or in relation to research.
- Work independently and efficiently on your own, in teams as well as in interdisciplinary environments. Engage in national and international research.
- Apply life-long learning as a principle to independently assess and structure learning processes and assume responsibility for continuous academic development.
- Create ideas and strategies for development of environmental technology in relation to remediation and reduction of pollution from soil, waters and atmosphere.
- Define a scientific problem, set up corresponding hypotheses, plan and execute experiments to test the hypothesis and communicate the results in writing as well as orally.
- Using digital platforms, the student will be able to acquire and process experimental data, and to visualize and evaluate experimental data using statistics and mathematical models.

3.2 Chemistry, Toxicology and Health

In addition to the generic competence profile, graduates holding an MSc in Environmental Science with specialisation in Chemistry, Toxicology and Health have acquired the following:

Knowledge about:

- Physical, chemical and biological processes in the atmosphere, in soil and in water.
- International original specialist literature on environmental chemistry, environmental microbiology, ecotoxicology, human toxicology and environmental epidemiology.
- The effects and the toxicity of pollutants on living organisms.
- Intrinsic pollutant properties governing distribution, fate and effects including computational tools for predicting pollutant properties and fate.
- The classification of chemical substances in relation to their hazard level and definition principles for determining threshold values for the external environment, working environment, consumer products and food.
- Instrumental and analytical methods, experimental approaches and modern biotechnological tools to study and quantify pollutant fate and effects.

- Strategies and methods for pollution mitigation and pollutant degradation including remediation methods.
- The fundamental principles governing environmental policy/legislation, regulation and management in Europe, and how legislative and regulatory measures can be utilised for reducing environmental impact.

Skills in/to:

- Set up mass and energy flows and quantify substance transformations in soil, water and air, in particular the transformation of pollutants, using modern models and be able to validate model predictions.
- Measure the effect of pollutants on organisms in the environment.
- Master the most important databases on chemical, microbiological and toxicological substances in relation to pollutants.
- Participate in the design and execution of scientific experiments.
- Apply basic scientific principles in connection with the analysis of large data.

Competences in/to:

- Expand the field of environmental chemistry by developing new technology, by introducing new analysis and monitoring methods as well as by assessing and solving environmental and health problems and mitigating potential threats.

3.3 Soil and Water

In addition to the generic competence profile, graduates holding an MSc in Environmental Science with specialisation in Soil and Water have acquired the following:

Knowledge about:

- Physical, chemical and biological processes in soil and in water and their interactions in the environment.
- Systemic and quantitative linkages between natural resource use in the catchment and water quality, e.g. land use impact on environmental systems.
- Strategies and methods for handling and solving environmental problems and mitigate challenges to ensure good quality of soils and freshwater systems.
- Implications of sustainability concepts.
- Lessons learned from the environmental and land use history.
- Depending on the combination of restricted elective courses chosen by the student knowledge about one or more of the following subject areas will be acquired: Effects and toxicity of pollutants on living organisms in soil and water; experimental- and data processing methods for sampling, chemical analysis, monitoring and assessment of soil and water pollutants and/or quality; functional biodiversity; ecology; and modelling and mapping of soil-water systems.

Skills in/to:

- Formulate the kinetics, equilibrium and mass balances for chemical, physical and biological processes affecting circulation of matter, and in particular pollutants, in ecosystems with special focus on soil and water.
- Use models to calculate element balances and environmental loads on soil and water compartments.
- Understand and evaluate the methods and techniques used for environmental monitoring, and subsequent handling of statistical analysis and presentation of environmental data.

- Depending on the combination of restricted elective courses chosen, the student may acquire skills in the design and execution of scientific experiments, including the selection of experimental methodology and statistical analysis.

Competences in/to:

- Depending on the combination of restricted elective courses chosen by the student, competencies in either generation of research results on environmental processes and impacts, or the transfer of such research results into proposals for improving sustainability of land use with special focus on water resources, agricultural, horticultural and forest systems will be acquired.

4 Admission requirements

4.1 Bachelor's degrees that automatically fulfil the academic requirements

Applicants with one of the following Bachelor's degrees automatically fulfil the academic requirements for admission to the MSc Programme in Environmental Science:

- Natural Resources (*naturressourcer*) with the specialisation in Environmental Science from University of Copenhagen (reserved access).
- Chemistry (*kemi*), Biology (*biologi*), Biochemistry (*biokemi*), Biotechnology (*bioteknologi*), or Molecular Biomedicine (*molekylær biomedicin*) from University of Copenhagen.
- Pharmacy from University of Copenhagen.
- Chemistry, Biology, Biochemistry, Biotechnology engineering (*civilingeniør* or *diplomingeniør*) or Medicinal Chemistry from Aarhus University.
- Chemistry, Biology, Pharmacy, Engineering (Chemistry and Biotechnology) or Biochemistry and Molecular Biology from University of Southern Denmark.
- Chemical Engineering and Biotechnology or Sustainable Biotechnology from Aalborg University.
- Technical Science (*teknisk videnskab*) with specialisation in Environmental Technology (*miljøteknologi*) (the graduate engineer programme) from Technical University of Denmark.
- Natural Sciences or International Bachelor in Natural Sciences from Roskilde University.
- Bachelor of Science in Engineering (Environmental Engineering) (*Vand, Bioressourcer og Miljømanagement*), Biotechnology or Chemistry and Technology from Technical University of Denmark.

4.2 Other Bachelor's degrees

Applicants with a Bachelor's degree, Professional Bachelor's degree or equivalent from Danish or international universities other than those listed in 4.1 are qualified for admission to the MSc Programme in Environmental Science if the programme includes three of the following five areas:

- Biology or ecology 7.5 ECTS
- Natural resources 7.5 ECTS
- Geochemistry 7.5 ECTS
- Environmental chemistry 7.5 ECTS
- Chemistry 7.5 ECTS

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

4.4 Language requirements
Applicants must be able to document English proficiency corresponding to one of the following:

- upper secondary school degree, bachelor's degree or master's degree in English from Australia, Canada, Ireland, New Zealand, United Kingdom or USA.
- Nordic entrance examination with an English level comparable to the Danish level B or higher
- International Baccalaureate (IB) from an international school
- European Baccalaureate (EB) from one of the approved schools
- English B or A as Single Subject Course in Denmark
- Abiturzeugnis from Germany
- IELTS test score of minimum 6.5
- TOEFL test score of minimum 83
- Cambridge Advanced English (CAE) or Cambridge English: Proficiency (CPE) passed at level C1 or C2

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

However, subject elements passed before the completion of the Bachelor's programme may be included in the overall assessment. This includes subject elements completed as continuing education as well as subject elements completed as part of a former higher education program. A maximum of 30 ECTS supplementary subject elements can be included in the overall assessment.

Subject elements passed before completing the Bachelor's programme which are to form part of the MSc programme to which the student has a legal right of admission (§15-courses) cannot be included in the overall assessment.

5 Prioritisation of applicants
With a Bachelor's degree in Natural Resources with the specialisation in Environmental Science from University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Environmental Science if the student applies in time to begin the MSc Programme within three years of the completion of the Bachelor's degree.

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

- Total number of ECTS in relevant courses in chemistry, environmental chemistry, natural resources, or ecology.
- Grade-point average achieved in qualifying degree.

6 Structure of the programme

The compulsory subject elements, restricted elective subject elements and the thesis constitute the central parts of the programme (Section 30 of the Ministerial Order on Bachelor and Master's Programmes (Candidatus) at Universities).

6.1 Chemistry, Toxicology and Health

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

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

6.1.1 Compulsory subject elements

All of the following subject elements are to be covered (45 ECTS):

Course Code	Course Title	Block	ECTS
NPLK18000U	Toxicology and Ecotoxicology	Block 1	7.5 ECTS
NPLK14021U	Soil and Water Pollution - Concepts and Theory	Block 1	7.5 ECTS
NPLK14029U	Soil and Water Pollution - Experimental Assessment	Block 2	7.5 ECTS
NKEA09012U	Air Pollution and Health	Block 2	7.5 ECTS
SMKK09001U	Environmental Epidemiology	Block 3	7.5 ECTS
NIFK15005U	Environmental and Human Health Risk Assessment of Chemicals	Block 4	7.5 ECTS

6.1.2 Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis, 30 ECTS)
15 ECTS are to be covered as subject elements from the following list (thesis, 45 ECTS)

Course Code	Course Title	Block	ECTS
NPLK13003U	Advanced Analytical Chemistry - Sampling and Sample Preparation	Block 1	7.5 ECTS
SFKK18004U	In-vitro Techniques in Biochemistry and Pharmacology	Block 1	7.5 ECTS
NPLK17001U	Advanced Microbial Biotechnology	Block 1	7.5 ECTS
NPLK19002U	Experimental Soil Analysis	Block 1	7.5 ECTS
NPLK14004U	Life Cycle Assessment within Biological Production Systems	Block 1	7.5 ECTS
NMAK14003U	Applied Statistics	Block 2	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
NPLK13004U	Advanced Analytical Chemistry - Chromatography and Mass Spectrometry	Block 2	7.5 ECTS
LNAK10081U	Nature Perception -Theories and Methods for Investigation	Block 2	7.5 ECTS
NBIK12003U	Conservation Biology	Block 2	7.5 ECTS
NBIK14001U	Climate Change and Biogeochemical Cycles	Block 2	7.5 ECTS
NPLK16003U	Experimental Analytical Chemistry: Method Development and Quality Assurance	Block 2	7.5 ECTS
NPLK14006U	Pesticide Use, Mode of Action and Ecotoxicology	Block 3	7.5 ECTS
NFYK15002U	Advanced Methods in Applied Statistics	Block 3	7.5 ETCS
NPLB14027U	Analytical Chemistry	Block 3	7.5 ECTS
NIGK17000U	Land Use and Environmental Modelling	Block 3	7.5 ECTS
NIGK16000U	Applied Ecosystem Ecology	Block 3	7.5 ECTS

Course Code	Course Title	Block	ECTS
NFOK21000U	Advanced Chemometrics and Machine Learning	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
NBIA08011U	Statistics for Molecular Biomedicine	Block 3	7.5 ECTS
NPLK22002U	Data Processing in Environmental Science and Agriculture	Block 3	7.5 ECTS
NPLK25002U	Functional Biodiversity	Block 3	7.5 ECTS
NIGK19001U	Introduction to Geomicrobiology	Block 4	7.5 ECTS
LNAK10010U	Environmental Impact Assessment	Block 4	7.5 ECTS
NIGK23005U	Carbon Storage and Biological Interactions in Soils	Block 4	7.5 ECTS
NPLK25004U	Non-Target Screening for Environmental Analysis	Block 4	7.5 ECTS
	Project outside the Course Scope	Block 1-5	7.5 ECTS
	Project outside the Course Scope	Block 1-5	15 ECTS
	Project in Practice	Block 1-5	15 ECTS

6.1.3 Elective subject elements

15 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 15 ECTS may be included in the MSc Programme.
- Projects. See 6.1.4 Projects.

6.1.4 Projects

- Projects outside the course scope (PUK) may be included in the elective and restricted elective section of the programme with up to 15 ECTS. PUK may not exceed 15 ECTS in total of the programme PUK may be written as a combination of the restricted elective and elective section of the programme. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Projects in practice (PIP) may be included in the elective or restricted elective section of the programme with 15 ECTS. PIP may not exceed 15 ECTS in total of the programme. PIP may be written as a combination of the restricted elective and elective section of the programme. The exam must be assessed with a grade (7-point grading scale). The primary supervisor must be employed at SCIENCE. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects (PREP) may not be included in the elective section of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

6.1.5 Thesis

The MSc Programme in Environmental Science – Chemistry, Toxicology and Health includes a thesis corresponding to 30 or 45 ECTS as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

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

6.1.6 Academic mobility

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

For students admitted in September the academic mobility in the MSc Programme in Environmental Science with a thesis corresponding to 30 ECTS is placed in block 1+2 of the 2nd year.

For students admitted in February the academic mobility in the MSc Programme in Environmental Science with a thesis corresponding to 30 ECTS is placed in block 3+4 of the 2nd year.

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

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

6.2 Soil and Water

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, 30 ECTS
- Thesis, 45 ECTS

6.2.1 Compulsory subject elements

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

Course Code	Course Title	Block	ECTS
NPLK14021U	Soil and Water Pollution – Concepts and Theory	Block 1	7.5 ECTS
NIGK17000U	Land Use and Environmental Modelling	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:

Course Code	Course Title	Block	ECTS
NPLK19002U	Experimental Soil Analysis	Block 1	7.5 ECTS
NPLK13003U	Advanced Analytical Chemistry – Sampling and Sample Preparation	Block 1	7.5 ECTS
NPLK18000U	Toxicology and Ecotoxicology	Block 1	7.5 ECTS
NPLK21001U	Plants in Populations and Communities	Block 1	7.5 ECTS
NPLK14023U	Applied Agrohydrology	Block 2	7.5 ECTS
NIGK14052U	Landscape and Restoration Ecology	Block 2	7.5 ECTS
NPLK14029U	Soil and Water Pollution – Experimental Assessment	Block 2	7.5 ECTS
NPLB14027U	Analytical Chemistry	Block 3	7.5 ECTS
NPLK22002U	Data Processing in Environmental Science and Agriculture	Block 3	7.5 ECTS
NIGK14002U	Geographical Information Systems (GIS)	Block 3	7.5 ECTS
NBIK14016U	Experimental Design and Statistical Methods in Biology	Block 3	7.5 ECTS
NPLK25002U	Functional Biodiversity	Block 3	7.5 ECTS
NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS
NIGK15005U	Ecological Modelling	Block 4	7.5 ECTS
NPLK25004U	Non-Target Screening for Environmental Analysis	Block 4	7.5 ECTS

6.2.3 Elective subject elements

30 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 15 ECTS may be included in the MSc Programme.
- Projects. See 6.3.4 Projects.

6.2.4 Projects

Projects outside the course scope (PUK) and projects in practice (PIP) may not exceed 15 ECTS of the programme.

- PUK may be included in the elective section of the programme with up to 15 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- PIP may be included in the elective section of the programme with 15 ECTS. The exam must be assessed with a grade (7-point grading scale). The primary supervisor must be employed at SCIENCE. The regulations are described in Appendix 4 to the shared section of the curriculum.
- Thesis preparation projects (PREP) may not be included in the elective section of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

6.2.5 Thesis

The MSc Programme in Environmental Science – Soil and Water includes a thesis corresponding to 45 ECTS as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

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

6.2.6 Academic mobility

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

The academic mobility in the MSc Programme in Environmental Science – Soil and Water 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 Amendment

The curriculum may be amended once a year so that any changes come into effect at the beginning of the academic year. Amendments must be proposed by the study board and approved by the Dean.

Notification about amendments that tighten the admission requirements for the programme will be published online at science.ku.dk one year before they come into effect.

If amendments are made to this curriculum, an interim arrangement may be added if necessary to allow students to complete their MSc Programme according to the amended curriculum.

Appendix 1 The recommended academic progression

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

Tables for students admitted to the MSc Programme in Environmental Science in September (summer):

Table – Chemistry, Toxicology and Health (Thesis 30 ECTS)

Period	Block 1	Block 2	Block 3	Block 4
1st year	Toxicology and Ecotoxicology	Air Pollution and Health	Environmental Epidemiology	Environmental and Human Health Risk Assessment of Chemicals
	Soil and Water Pollution, Concepts and Theory	Soil and Water Pollution, Experimental Assessment	Restricted elective	Restricted elective
2nd year	Elective	Elective	Thesis	
	Restricted elective	Restricted elective		

Table – Chemistry, Toxicology and Health (Thesis 45 ECTS)

Period	Block 1	Block 2	Block 3	Block 4
1st year	Toxicology and Ecotoxicology	Air Pollution and Health	Environmental Epidemiology	Environmental and Human Health Risk Assessment of Chemicals
	Soil and Water Pollution, Concepts and Theory	Soil and Water Pollution, Experimental Assessment	Restricted elective	Restricted elective
2nd year	Elective	Thesis		
	Elective			

Table – Soil and Water

Period	Block 1	Block 2	Block 3	Block 4
1st year	Soil and Water Pollution – Concepts and Theory	Restricted elective	Land Use and Environmental Modelling	Restricted elective
	Elective	Restricted elective	Restricted elective	Elective
2nd year	Elective	Thesis		
	Elective			

Table for students admitted to the MSc Programme in Environmental Science in February (winter):

Table – Chemistry, Toxicology and Health (Thesis 30 ECTS)*

Period	Block 3	Block 4	Block 1	Block 2
1st year	Environmental Epidemiology	Environmental and Human Health Risk Assessment of Chemicals	Toxicology and Ecotoxicology	Air Pollution and Health
	Restricted elective	Restricted elective	Soil and Water Pollution, Concepts and Theory	Soil and Water Pollution, Experimental Assessment
2nd year	Elective	Elective	Thesis	
	Restricted elective	Restricted elective		

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

Table – Chemistry, Toxicology and Health (Thesis 45 ECTS)*

Period	Block 3	Block 4	Block 1	Block 2
1st year	Environmental Epidemiology	Environmental and Human Health Risk Assessment of Chemicals	Toxicology and Ecotoxicology	Air Pollution and Health
	Restricted elective	Restricted elective	Soil and Water Pollution, Concepts and Theory	Soil and Water Pollution, Experimental Assessment
2nd year	Elective	Thesis		
	Elective			

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

Table – Soil and Water*

Period	Block 3	Block 4	Block 1	Block 2
1st year	Land Use and Environmental Modelling	Elective	Soil and Water Pollution – Concepts and Theory	Elective
	Restricted elective	Restricted elective	Restricted elective	Restrictive elective
2nd year	Elective	Thesis		
	Elective			

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

Appendix 2 Interim arrangement

The Shared Section that applies to all BSc, part-time MSc and MSc Programmes at the Faculty of Science applies to all students.

The interim arrangements below only consist of parts where the current curriculum differs from the rules and regulations that were previously valid. Therefore, if information about relevant rules and regulations are missing, it can be found in the curriculum above.

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

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

1.1 Chemistry, Toxicology and Health

Restricted elective subject elements

30 ECTS are to be covered as subject elements from the following list (thesis, 30 ECTS)
15 ECTS are to be covered as subject elements from the following list (thesis, 45 ECTS)

Restricted elective subject elements offered as part of the specialisation in Chemistry, Toxicology and Health in this curriculum (see above)			
NKEK11002U	Atmospheric Environmental Chemistry	Discontinued*	7.5 ECTS

*See discontinued courses below

1.2 Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad)

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

- Compulsory subject elements, 22.5 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 7.5 ECTS.
- Compulsory studies at partner university 60 credits including thesis (2nd year)

Table - Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad)

Period	Block 1	Block 2	Block 3	Block 4
1st year	**Soil and Water Pollution – Concepts and Theory**	***Environmental Management in Europe***	**Land Use and Environmental Modelling**	**Elective**
	Restricted elective	**Restricted elective**	**Restricted elective**	**Restricted elective**
2nd year	**2nd year at partner university**			

Restricted elective subject elements

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

1) 15 ECTS are to be covered as subject elements from the following list:

Course Code	Course Title	Block	ECTS
NPLK18000U	Toxicology and Ecotoxicology	Block 1	7.5 ECTS
NPLK13003U	Advanced Analytical Chemistry - Sampling and Sample Preparation	Block 1	7.5 ECTS
NPLK19002U	Experimental Soil Analysis	Block 1	7.5 ECTS

Course Code	Course Title	Block	ECTS
NIGK14052U	Landscape and Restoration Ecology	Block 2	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
NPLK14029U	Soil and Water Pollution – Experimental Assessment	Block 2	7.5 ECTS
NPLK13004U	Advanced Analytical Chemistry - Chromatography and Mass Spectrometry	Block 2	7.5 ECTS
NBIK14007U	Soil Biology	Block 2	7.5 ECTS
NPLK14023U	Applied Agrohydrology	Block 2	7.5 ECTS

2) 15 ECTS are to be covered as subject elements from one of the following lists according to choice of sub-specialisation/profile:

Profile: Water Resources

Course Code	Course Title	Block	ECTS
NIGK15027U	Surface Hydrology	Block 3	7.5 ECTS
NIGK21007U	Integrated Water Resources	Block 3	7.5 ECTS
NPLB14027U	Analytical Chemistry	Block 3	7.5 ECTS
NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS
NIGK15005U	Ecological Modelling	Block 4	7.5 ECTS

Profile: Environmental Impact

Course Code	Course Title	Block	ECTS
LTEK10157U	Natural Resource Sampling and Modelling	Block 3	7.5 ECTS
NPLK20000U	Plant Ecophysiology in a Changing Climate	Block 3	7.5 ECTS
LNAK10010U	Environmental Impact Assessment	Block 4	7.5 ECTS
NIFK15005U	Environmental and Human Health Risk Assessment of Chemicals	Block 4	7.5 ECTS

Elective subject elements

7.5 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.3.4 Projects.

Projects

- Projects outside the course scope may be included in the elective section of the programme with 7.5 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Thesis preparation projects may not be included in the elective section of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis

The MSc Programme in Environmental Science with the specialisation Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad) includes a thesis corresponding to 30 ECTS. The topic of the thesis must be within the academic scope of the programme and the thesis must be carried out in accordance with the rules defined by the host university.

1.3 Soil, Water and Biodiversity (1st year abroad, 2nd year at UCPH).

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

- Compulsory studies at partner university, 60 ECTS (1st year)
- Compulsory subject elements, 7.5 ECTS
- Restricted elective subject elements, 15 ECTS.
- Elective subject elements, 7.5 ECTS.
- Thesis, 30 ECTS

Profile: Water Resources

Table - Soil, Water and Biodiversity (1st year abroad, 2nd year at UCPH)

Period	Block 1	Block 2	Block 3	Block 4
1st year	1st year at partner university			
2nd year	Soil and Water Pollution – Concepts and Theory	Elective	Thesis	
	Restricted elective	Restricted elective		

Restricted elective subject elements

15 ECTS are to be covered from the following lists after 1st year at the partner university:

Course Code	Course Title	Block	ECTS
NPLK13003U	Advanced Analytical Chemistry - Sampling and Sample Preparation	Block 1	7.5 ECTS
NPLK19002U	Experimental Soil Analysis	Block 1	7.5 ECTS
NPLK13004U	Advanced Analytical Chemistry – Chromatography and Mass Spectrometry	Block 2	7.5 ECTS
NPLK14023U	Applied Agrohydrology	Block 2	7.5 ECTS
NPLK14029U	Soil and Water Pollution – Experimental Assessment	Block 2	7.5 ECTS
NPLK16003U	Experimental Analytical Chemistry – Method Development and Quality Assurance	Block 2	7.5 ECTS

Profile: Soil Resources and Land Use

Table - Soil, Water and Biodiversity (1st year abroad, 2nd year at UCPH)

Period	Block 1	Block 2	Block 3	Block 4
1st year	1st year at partner university			
2nd year	Soil and Water Pollution – Concepts and Theory	Elective	Thesis	
	Restricted elective	Restricted elective		

Restricted elective subject elements

15 ECTS are to be covered from the following lists after 1st year at the partner university:

Course Code	Course Title	Block	ECTS
NPLK17001U	Advanced Microbial Biotechnology	Block 1	7.5 ECTS
NPLK19002U	Experimental Soil Analysis	Block 1	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
NPLK14023U	Applied Agrohydrology	Block 2	7.5 ECTS
NPLK14029U	Soil and Water Pollution – Experimental Assessment	Block 2	7.5 ECTS

Profile: Environmental Impact

Table - Soil, Water and Biodiversity (1st year abroad, 2nd year at UCPH)

<table>
<tr><th>Period</th><th>Block 1</th><th>Block 2</th><th>Block 3</th><th>Block 4</th></tr>
<tr><td>1st year</td><td colspan="4">1st year at partner university</td></tr>
<tr><td rowspan="2">2nd year</td><td>Life Cycle Assessment within Biological Production Systems (NPLK14004U)</td><td>Elective</td><td rowspan="2">Thesis</td><td rowspan="2"></td></tr>
<tr><td>Restricted elective</td><td>Restricted elective</td></tr>
</table>

Restricted elective subject elements

15 ECTS are to be covered from the following lists after 1st year at the partner university:

Course Code	Course Title	Block	ECTS
NPLK17001U	Advanced Microbial Biotechnology	Block 1	7.5 ECTS
NPLK14019U	Plant Nutrition and Soil Fertility	Block 1	7.5 ECTS
NPLK21001U	Plants in Populations and Communities	Block 1	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
NIGK14052U	Landscape and Restoration Ecology	Block 2	7.5 ECTS

All profiles

Elective subject elements

7.5 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.5.7 Projects.

Projects

- Projects outside the course scope may be included in the elective section of the programme with 7.5 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Thesis preparation projects may be included in the elective section of the programme with up to 7.5 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 4 to the shared section of the curriculum.

Thesis
The MSc Programme in Environmental Science with a specialisation in Soil, Water and Biodiversity (1st year abroad, 2nd year at UCPH) includes a thesis corresponding to 30 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of programme.

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

2 General changes for students admitted in the academic year 2022/23

Students admitted to the MSc Programme in the academic year 2022/23 must finish the programme as listed in the curriculum above with the following exceptions.

2.1 Chemistry, Toxicology and Health

Restricted elective subject elements
30 ECTS are to be covered as subject elements from the following list (thesis, 30 ECTS)
15 ECTS are to be covered as subject elements from the following list (thesis, 45 ECTS)

Restricted elective subject elements offered as part of the specialisation in Chemistry, Toxicology and Health in this curriculum (see above)			
NFYK13011U	Applied Statistics: From Data to Results	Block 2	7.5 ECTS
NIGK22001U	Use of Stable Isotopes for Advanced Studies of Environmental and Soil Biogeochemical Processes.	Discontinued*	7.5 ECTS
NKEK11002U	Atmospheric Environmental Chemistry	Discontinued*	7.5 ECTS

*See discontinued courses below

2.3 Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad)

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

- Compulsory subject elements, 22.5 ECTS.
- Restricted elective subject elements, 30 ECTS.
- Elective subject elements, 7.5 ECTS.
- Compulsory studies at partner university 60 credits including thesis (2nd year)

Table - Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad)

Period	Block 1	Block 2	Block 3	Block 4
1st year	**Soil and Water Pollution – Concepts and Theory**	***Environmental Management in Europe***	**Land Use and Environmental Modelling**	**Elective**
	Restricted elective	**Restricted elective**	**Restricted elective**	**Restricted elective**
2nd year	**2nd year at partner university**			

Restricted elective subject elements
30 ECTS are to be covered as subject elements from the following two lists:

1) 15 ECTS are to be covered as subject elements from the following list:

Course Code	Course Title	Block	ECTS
NPLK18000U	Toxicology and Ecotoxicology	Block 1	7.5 ECTS

Course Code	Course Title	Block	ECTS
NPLK13003U	Advanced Analytical Chemistry - Sampling and Sample Preparation	Block 1	7.5 ECTS
NPLK19002U	Experimental Soil Analysis	Block 1	7.5 ECTS
NIGK14052U	Landscape and Restoration Ecology	Block 2	7.5 ECTS
LBIK10180U	Applied Microbiology	Block 2	7.5 ECTS
NPLK14029U	Soil and Water Pollution – Experimental Assessment	Block 2	7.5 ECTS
NPLK13004U	Advanced Analytical Chemistry - Chromatography and Mass Spectrometry	Block 2	7.5 ECTS
NBIK14007U	Soil Biology	Block 2	7.5 ECTS
NPLK14023U	Applied Agrohydrology	Block 2	7.5 ECTS
LFKK10265U	Conflict Management	Block 2	7.5 ECTS

2) 15 ECTS are to be covered as subject elements from one of the following lists according to choice of sub-specialisation/profile:

Profile: Water Resources

Course Code	Course Title	Block	ECTS
NIGK15027U	Surface Hydrology	Block 3	7.5 ECTS
NIGK21007U	Integrated Water Resources	Block 3	7.5 ECTS
NPLB14027U	Analytical Chemistry	Block 3	7.5 ECTS
NBIK14004U	Freshwater Ecology	Block 4	7.5 ECTS
NIGK15005U	Ecological Modelling	Block 4	7.5 ECTS

Profile: Environmental Impact

Course Code	Course Title	Block	ECTS
LTEK10157U	Natural Resource Sampling and Modelling	Block 3	7.5 ECTS
NPLK20000U	Plant Ecophysiology in a Changing Climate	Block 3	7.5 ECTS
LNAK10010U	Environmental Impact Assessment	Block 4	7.5 ECTS
NIFK15005U	Environmental and Human Health Risk Assessment of Chemicals	Block 4	7.5 ECTS

Elective subject elements

7.5 ECTS are to be covered as elective subject elements.

- All subject elements at MSc level may be included as elective subject elements in the MSc Programme.
- BSc subject elements corresponding to 7.5 ECTS may be included in the MSc Programme.
- Projects. See 6.3.4 Projects.

Projects

- Projects outside the course scope may be included in the elective section of the programme with 7.5 ECTS. The primary supervisor must be employed at either SCIENCE or SUND. The regulations are described in Appendix 5 to the shared section of the curriculum.
- Thesis preparation projects may not be included in the elective section of the programme. The regulations are described in Appendix 6 to the shared section of the curriculum.

Thesis

The MSc Programme in Environmental Science with the specialisation Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad) includes a thesis corresponding to 30

ECTS. The topic of the thesis must be within the academic scope of the programme and the thesis must be carried out in accordance with the rules defined by the host university.

3 Discontinued courses

Course Code	Course Title	ECTS	Interim arrangement
NKEK11002U	Atmospheric Environmental Chemistry	7.5	The course was restricted elective on Chemistry, Toxicology and Health in the academic year 2023/24 and earlier. Offered for the last time: 2023/24 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2024/25
NPLK22000U	Environmental Management in Europe		The course was compulsory on Soil, Water and Biodiversity (1st year at UCPH, 2nd year abroad) in the academic year 2024/25 and earlier. Offered for the last time: 2024/25 Last exam if applicable (cf. SCIENCE's Teaching and exam rules): 2025/26
NIGK22001U	Use of Stable Isotopes for Advanced Studies of Environmental and Soil Biogeochemical Processes.	7.5	The course was restricted elective on Chemistry, Toxicology and Health in the academic year 2022/23. Offered for the last time: 2022/23 The course is identical to NIGK23005U Carbon Storage and Biological Interactions in Soils

Appendix 3 Description of objectives for the thesis

After completing the thesis, the student should have:

Knowledge about:

- Define and explain scientific problems within the study programme's subject areas.
- Methodologies/theories based on international research for defining the problem formulation.
- Digital tools to use for analysis, evaluation and visualization of data
- Theories/models based on an organised value system and with a high degree of independence.

Skills in/to:

- Apply and critically evaluate theories/methodologies/ digital tools, 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.
- 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 academic work in a research context.
- Solve complex problems and carry out development assignments in a work context.