PhD in Biosciences

See study programme

Autumn 2024 (1. semester)

Science and Ethics in Practice	DR433F 5 sp
Frontier Topic in Biosciences	DR444F 5 sp

Elective courses

Advanced Biological Data Analysis	BIO9000 5 sp
Current Topics in Ecology I	BIO9003 5 sp
Aquaculture Production and Environmental Impacts	BIO9002 5 sp

Spring 2025 (2. semester)

Elective courses

Molecular Biology of RNA	BIO9006 5 sp
Current Topics in Ecology II	BIO9004 5 sp
Biodiversity and Biogeography	BIO9007 5 sp
Modelling the distribution of biodiversity under global change	BIO9009 5 sp
Population Genomics	BIO9001 5 sp
Comparative Immunology	DR446F 5 sp
Principles in Animal Experimentation	DR443F 5 sp
High Throughput Sequencing of Non-Model Organisms	DR425F 5 sp

Individual Special Curriculum	DR435F 5 sp

Autumn 2026 (5. semester)

Elective courses	
Advanced Biological Data Analysis	BIO9000 5 sp
Current Topics in Ecology I	BIO9003 5 sp
Aquaculture Production and Environmental Impacts	BIO9002 5 sp

Spring 2027 (6. semester)

Doctoral Thesis	DR445F 0 sp

Elective courses	
Molecular Biology of RNA	BIO9006 5 sp
Current Topics in Ecology II	BIO9004 5 sp
Biodiversity and Biogeography	BIO9007 5 sp
Modelling the distribution of biodiversity under global change	BIO9009 5 sp
Population Genomics	BIO9001 5 sp
Comparative Immunology	DR446F 5 sp
Principles in Animal Experimentation	DR443F 5 sp
High Throughput Sequencing of Non-Model Organisms	DR425F 5 sp
Individual Special Curriculum	DR435F 5 sp

Education training component:

The doctoral programme is designed in such a way that candidates can complete their studies within the stipulated time frame, normally three years of full-time work. An important part is the educational training component with a set of appropriate courses at PhD level. The training component consists of an educational segment of credit-earning courses (30 ECTS) and a presentation segment that covers the dissemination/communication of the research conducted by the candidate as an essential part of the programme. Courses included in the training component are normally bioscience-related and this helps the candidate to get an in-depth understanding of the research theme. Technology-related topics such as those on bioinformatics, artificial intelligence, and other topics may also be included, if deemed relevant for the training component, to support the PhD research project.

The training component consists of mandatory coursework of 10 credits: covering philosophy and ethics in science (DR443F Science and Ethics in Practice, 5 ECTS) and one PhD level course in a subject area directly related to the student's research topic (DR444F Frontier Topic in Bioscience, 5 ECTS). PhD students are advised to complete the mandatory course Science and Ethics in Practice during the first year of their studies. This helps to create awareness on the philosophy of science, and to anchor the candidate’s research efforts on ethical principles relevant for the fair conduct of studies by following national and international standards, guidelines and regulations to generate knowledge relevant for the society, preserve biodiversity and protect nature. The remaining 20 credits of the training component consist of elective coursework (an overview of the electives is found in appendix 7). Students are encouraged to choose courses from the PhD course portfolio at the faculty, provided they are relevant for their research theme. A minimum of 10 ECTS should be obtained from courses offered at Nord, which opens the possibility of including up to 10 credits of master-level courses that are suitable for the candidate’s research project (in this case §9-1 of the PhD regulations at Nord University applies and candidates must obtain a grade B or better). Relevant PhD courses offered at other universities in Norway or abroad, or by a third party that conducts appropriate workshops/PhD-level courses, may also be recognised as part of the training component. External courses that do not have a formal approval as components of PhD education must be quality assessed by the main supervisor in consultation with the programme coordinator to verify their learning outcomes (no more than 5 ECTS can be gained from such courses). Furthermore, the candidate may participate in and earn credits from Research Schools funded by the Research Council of Norway (e.g., “NORBIS”, “PHOTOSYNTEC”) where researchers with expert knowledge in the field of biosciences hold courses and share their competence with PhD students.

As part of the presentation segment, candidates are required to actively participate in recognised national and international research environments and disseminate and communicate results originating from their PhD project (transferable skill activities). The candidate must give at least two internal presentations (oral) at the faculty and at least two external presentations (either oral or poster), mainly at national / international conferences. The study programme coordinator approves the course and presentation segments which form part of the candidate’s training component.

Research component:

The research component together with transferable skill activities includes preparation of a PhD thesis that is an independent academic work based on an original piece of high-quality research within biosciences. Normally the research topic is aligned to one of the research disciplines at the faculty. In certain cases of multi-disciplinary themes, competences from other faculties at Nord University or regional institutions or industry can be made use of to conduct cutting-edge research. Candidates in the programme that are linked to externally-financed projects, especially those funded by the industry, gain knowledge and skills that are important for the chosen area of applied biosciences. These learning outcomes could then be directly transferred to the respective sectors, thus benefiting society. Irrespective of the funding source, all PhD research work is carried out, in accordance with the existing learning outcomes, under the guidance of an academic supervisory committee. The research theme is normally part of an externally-funded research project, or a PhD project awarded by the faculty administration. The PhD student is expected to prepare a scientific thesis at an advanced academic level based on the research performed and to submit it for evaluation within the contractual period. The research work undertaken by the candidate during the contract period will be laboratory-based or field-oriented investigations, and/or bioinformatics-based on data collections. The research component in biosciences generally consists of several parts, normally including: 1) preparation and submission of the initial research project proposal for admission that describes the project objectives and envisaged experimental plan, and the feasibility of carrying out the research

within the stipulated time; 2) performing sampling/data collection/ laboratory work according to the project plan; 3) data analyses and interpretations that address the project objectives; 4) writing scientific papers or chapters aimed for peer-reviewed publication; and 5) compiling a coherent thesis that documents the candidate's scientific proficiency in the research theme. By addressing important and relevant problems, formulating new questions, developing new tools, methods, or approaches the candidate can acquire the necessary skills for self-driven investigations.

The resulting thesis is normally a compilation of coherent peer-reviewed published articles, or publishable scientific papers that reports new findings from the doctoral research performed by the candidate. The thesis includes an introductory segment that reviews the state-of-the-art in the field, and a discussion section that integrates the generated new knowledge in the articles and contextualises the research to meet international standards in the field. A thesis submitted by the candidate must be approved by the Research Board prior to it being sent for evaluation by an external committee. The evaluation committee appointed by the Research Board includes national and international experts in the field. The committee evaluates the thesis and submits a recommendation stating whether the doctoral work is worthy of defence for the doctoral degree and explaining the reasoning behind its assessment.

The educational training component and research component of the PhD programme together with the thesis and defence are in accordance with the national and international guidelines, and are intended to develop highly skilled scientists, and provide the academic breadth and depth as stated in the learning outcomes of the programme.

Learning outcomes

The erudition of the candidate completing a PhD degree at the Faculty will be on par with the national standards. Candidates who are adjudged as qualified for the Doctoral degree in Biosciences at Nord is expected to possess the knowledge, skill and general competency in the particular field of science.
The learning outcomes are maintained on the standards stipulated by the Norwegian Agency forQuality Assurance in Education (NOKUT; regulations on the supervision and control of the quality of Norwegian higher education "Tilsynsforskriften" § 4.2.)

Knowledge:
The candidate

- is at the forefront of knowledge within the academic field of biosciences and masters the field´s philosophy of science and methods required to answer questions arising in the pursuit of science

- must be capable of judging the implications of the research methods and processes chosen, including the ethical elements when relevant, in the quest of knowledge in biosciences

- should be proficient in biosciences and can develop new knowledge, theories, methods, elucidations, forms of documentation, and communication within their area of expertise

Skills:
The candidate

- can develop new research questions and topics for scholarly work in the field of biosciences, perform research meticulously, systematically, and timely to obtain the right answers

- can plan and conduct research fairly and righteously to achieve the set goals and obtain answers that are at the highest levels of international standards

- can solve complex academic questions and challenge established knowledge and practice within specific areas of biosciences

- can maintain scientific integrity while generating information relevant to society

- understand the value of nature and the importance of biosciences as a tool to appreciate it in its entirety

General competencies:
The candidate

- should be competent to manage and undertake assignments, projects and complex interdisciplinary tasks, individually and collaboratively when demanded

- can recognize ethical issues, new and otherwise, when performing research, disseminating and communicating knowledge, and be guided by strong moral principles that reflect the candidate's scholarship

- should be able to disseminate and communicate research through appropriate national and international channels to ensure knowledge-sharing with stakeholders and community at large

- can engage in debates on topics in biosciences in relevant forums

- can promote pluralism of cultural values and diversity of thought important in discourses to further our understanding in the field of biosciences

- can realize the importance of innovation to carry out novel research that aids the progression of human thinking and well-being, with minimal footprint on nature, and to align with the UN sustainable development goals.

- shares knowledge and protects it where necessary following internationally accepted guidelines and regulations

Admission requirements

1. Qualification
The Faculty of Biosciences and Aquaculture (FBA) welcomes applicants who have successfully completed their master's degree (120 ECTS) in biosciences or biosciences-related disciplines, which is relevant to the theme of the proposed research project, with a minimum average grade B (or its international accepted equivalence) or better.

Industry and public funded candidates can apply for admission, provided they have the necessary qualifications. International self-financed students are normally not accepted, but applicants with documented funding from governmental or non-governmental bodies will be considered for admission. Such candidates should contact the faculty’s PhD administration for further information regarding their eligibility for admission.

2. Financial Capacity
In order to be admitted to the PhD programme applicants must be able to source financing for the entire period of the doctoral studies (3 years). Possible funding sources may be a PhD fellow position financed by the Faculty of Biosciences and Aquaculture, if available, and other external sources, e.g. from the home country. Private funding (e.g. own or family's financial resources) does not normally qualify for admission to the PhD programme. Documented funding from research fellowship positions, scholarships or governmental/business bodies is required.

Particularly about PhD fellowship positions:
PhD research fellow positions at our faculty are generally fully funded for three years. These PhD positions are linked to a specific research project. Successful applicants for this position will be offered employment to enter the PhD programme in Biosciences. Available research fellow positions funded by the Faculty of Biosciences and Aquaculture will be announced on the university's website: https://www.nord.no/en/about/vacancies

Please check the Regulations for the doctor of philosophy degree at Nord University, including the Supplementary guidelines for the PhD in Biosciencesfor more detailed information on admission requirements for the PhD programme.

Career possibilities

Research projects are designed to advance the science and provide training in professional skills and theoretical knowledge that would ultimately enable a PhD candidate to work in research, academia, government, industry and private sector. The degree holders can contribute to the society either theoretically, methodologically or contextually, taking advantage of the knowledge and transferable skills acquired through the programme. A doctoral degree in Biosciences enables the graduate to be attractive for positions within academic or non-academic research environments, relevant knowledge-based sectors in the industry, or in administration and decision-making bodies, which confirms the societal relevance of the programme.

Further education

PhD is the highest form of academic education offered, and signifies the conclusion of studies.

Study abroad

Doctoral education at the Faculty of Biosciences and Aquaculture is internationally oriented. Candidates are expected to contribute to international conferences and publish in international peer-reviewed journals.

Based on the nature of the research project, you will complete part of your studies abroad, either in the form of prolonged research stays/visits at international institutions or by completing some of your courses abroad.

Costs

Running costs are generally covered by the funds of the project related to the research theme of the candidate.

Assessment methods

Course component: Pass/Fail
Students have to successfully complete the obligatory and elective courses, recommended as part of this programme.
Further, they have also to fulfill other academic requirements stipulated in the PhD contract.

Research component: Approved/Not approved, wherever applicable

Presentations, Publications, Dissertation, Trial lecture and Defense

The students will have to compile their research in the form of a dissertation that will be evaluated by an external committee. They will also have to publicly present a trial lecture and defend their dissertation successfully.

Graduation requirements

Successful completion of the training and research components followed by successful delivery of the trial lecture and defence of the PhD thesis.

Programme evaluation

Dialogue meetings are conducted between students and the programme director every year.

Qualifications requirements and regulations

Here we refer to "Regulations pertaining to studies and exams at Nord University " as well as local regulations and directives, see University Rules and Regulations.

Current active subject description (last updated 2023/24)

Science and Ethics in Practice

DR433F

Subject description

Course content: Science and Technology and Ecocrisis, Anthropocentrism vs Ecocentrism, Green knowledge - a long revolution, Human needs - alternatives and sustainability, Ethics and climate change, Intergenerational moral obligations, Policies responses and responsible individuals, Species boundaries in a world of diversity, Food - philosophy of agriculture and aquaculture, Interspecies rivalry - animals in wilderness and captivity, Animal's capacities and moral status, Experimenting with animals, Capitalizing on animals - Biotechnology and Biopower, Animal welfare

Four-day block session: week 48, 2017

Prerequisites

The applicants to this course should be enrolled as a PhD student at Nord University or other Universities/Colleges in Norway or abroad. The normal registration to this course ends by September 15 during the semester/year the course is being conducted.

Learning outcomes

On successful completion of the course the student should have the following learning outcomes

Knowledge
The student will:

- be aware of the ecological challenges brought on by industrial and technological advances
- realize the importance of addressing environmental and climate-related issues
- understand moral, social and political responsibilities when tackling challenges facing mankind
- be familiar with sustainability issues related to generating human food
- be mindful of respecting the value of animal life
- be cognizant of the rapid advances in biotechnology which may sometimes lead to unfamiliar ethical issues
- be able to duly recognize animal welfare issues

Skills
The student should:

- be able to recognize the issues that threaten the fragile ecosystems
- know how to promote sustainable development in all spheres of human activity
- be capable of making morally and ethically acceptable decisions related to environment, and coexistence of other species
- be able to foresee the advantages of utilizing the advances in science and technology within ethically acceptable boundaries

General competence
The student should:

- be aware of moral and ethical consequences of his or her actions
- be able to reason and reflect in order to make sound decisions that are scientifically and sociologically sound
- have the inspiration and conviction to lead, adhering to morally and ethically acceptable choices

Costs

No tuition fee. Students may have to pay up to NOK 750 for study materials and for one dinner arranged during the course.
External students will have to arrange their own travel and accommodation.

Additional information will be provided to registered students, prior to the commencement of the course.

Subject type

Compulsory: PhD Aquatic Biosciences

Learning activities

Lectures, lab exercises, individual presentations, and feedback.

Assessment methods and criteria:
Course involvement, Individual oral presentation during the course and written report. Pass/not pass. Active involvement in course-related activities prior to during the period will be assessed.

The individual oral presentation on a selected topic and the report based on it, which has to be submitted within a fortnight following the course, will primarily be used for assessing a candidate.

Subject evaluation

Constant dialogue with students during the lecture modules arranged in Bodø. Evaluation questionnaire to be provided to the students at the end of the course

Aid for the exam

Generating an answer using ChatGPT or similar artificial intelligence and submitting it wholly or partially as one's own answer is considered cheating.

Recommended prerequisites

General awareness on ethical principles, environmental issues and animal welfare concerns. The students would be provided introductory reading materials ahead of the course, in order to make them familiar with the topics to be dealt with during the course.

Current active subject description (last updated 2019/20)

Frontier Topic in Biosciences

DR444F

Subject description

As part of the compulsory training component of the PhD programme doctoral candidates are expected to enrol in a course of their choice at PhD level (5 ECTS), which is directly related to the subject area of the thesis (Nord University or external)

Subject type

Compulsory: PhD Aquatic Biosciences

Doctoral Thesis

DR445F