Marine Biology
Master
Description of the study programme

Marine biology belongs to the most attractive and fascinating disciplines within the natural sciences. It is also one of the most diverse disciplines. More than 70% of the Earth's surface is covered by oceans, and they play a crucial role especially for our climate. Only in the last 50 to 100 years the scientific and technological means have been developed to explore and study marine ecosystems in detail.

Marine biological research is of global socio-economic and political relevance. Among the most burning issues are for instance global warming and climate change, loss of biodiversity and effects of overfishing. Pending questions include: Where is the missing carbon dioxide that industries are producing, could the ocean be soaking it up, and how will it affect marine communities? Can, in turn, iron fertilization of phytoplankton growth effectively reduce the carbon dioxide concentration in the atmosphere over longer time spans? How does the increasing number of off-shore wind parks affect marine ecosystems? More applied aspects include the development of environmentally friendly aquaculture techniques, conservation biology and coastal zone management, as well as the search for bioactive substances in marine creatures for pharmaceutical purposes.

We are just at the beginning of an epoch of revolutionary discoveries. New technologies, such as remotely operated vehicles (ROV), autonomous underwater vehicles (AUV), computer-based modelling, and enhanced remote sensing techniques from satellites and animal platforms, are currently under development and will provide access to regions and depths that are still inaccessible today. These new technologies will grant us insight into marine ecosystems in unprecedented detail.

The unique concentration of world-class marine research institutions in the Federal State of Bremen provides the basis for the M.Sc. programme in Marine Biology which utilises both the expertise and the state-of-the-art research infrastructure for a progressive education of a new generation of marine scientists.
Admission Criteria and Requirements

Applicants must hold a bachelor (B.Sc.) degree in biology, ecology, environmental sciences, oceanography or a closely related discipline with an overall grade of at least 2.5 according to the German grading scheme, equivalent to an at least “good” study performance. International applicants will apply with their respective national grades, which will then be converted to the German grading scheme by the enrolment office. Fluency in English according to level C1 is required and must be demonstrated for instance by an IELTS or Unicert III test, (unless the last academic degree was obtained from a university, in which the primary language of instruction was English. For further information see www.fremdsprachenzentrum-bremen.de/vergleichstabelle).

Applications must include a curriculum vitae as well as a letter of motivation stating the applicant's interests and qualifications with regard to the study programme. Proofs that all admission criteria are met, a detailed description of the study progress such as a transcript of study records with ECTS values (or hours of teaching), grades and exam results, as well as copies of all relevant certificates and documents in English or German must be submitted together with the application.

The selection board will evaluate the applications according to the following criteria: 1) overall grade of the previous degree or overall study performance at the time of application (max. 40 points); 2) individual marks in relevant study disciplines such as marine biology, ecology or physiology (max. 40 points), and 3) letter of motivation (max. 20 points). If there are more applicants than vacant study places, applicants will be admitted according to their rank in the evaluation.

Applications may already be submitted before the previous study degree (i.e. usually B.Sc.) has been completed, when at least 135 ECTS have been obtained, equivalent to at least 4.5 semesters of study. In those cases, admission can be granted on the condition that all admission criteria are met two weeks after the start of the lecture period.

Please check current admission requirements at www.uni-bremen.de/en/masterportal/master-of-science.html
Career Perspectives
Graduates may continue their academic career as a doctoral candidate at the University of Bremen, at one of the associated research institutions or at other universities or research institutions worldwide. Employment opportunities for marine biologists exist in research and development, in the fishing and aquaculture industry as well as in the environmental conservation and management sector at governmental agencies or within NGOs and IGOs. Marine biologists also work at museums, zoological gardens, and aquaria. Additional employment opportunities for marine biologists include adjacent fields such as media (i.e. scientific journalism), eco-consulting, environmental impact assessments, and eco-tourism business. Marine biologists are also employed in the commercial and industrial sector, for instance for blue biotechnology, coastal zone management and the sustainable use of marine resources.
Curriculum

First term

Module A: Fundamentals of Marine Biology and Biological Oceanography
- Principles of Marine Biology & Biological Oceanography
- Principles of Marine Ecophysiology
- Experimental Design and Data Analysis

Module B: Multidisciplinary Oceanography
- Marine Geosciences
- Physical Oceanography
- Marine Chemistry
- Marine Biogeochemistry

Module C: Development of Personal Capabilities and Skills
- Scientific Communication
- Marine Research in Bremen
- Ocean Sciences Colloquium

The 1st term sets the scene for a successful qualification and academic career in marine biology by building up a sound theoretical background and introducing important concepts of marine biology and biological oceanography as well as the essential fundamentals of the neighbouring disciplines marine geosciences, physical oceanography, marine chemistry, and marine biogeochemistry. In this multidisciplinary approach, students will learn the importance of cross-disciplinary co-operation and exchange for successful state-of-the-art marine research. In addition, the first term offers the opportunity to improve personal capabilities and skills, in particular with regard to scientific communication and writing.
Second term
Module D: Marine Ecophysiology
- Marine Microbiology
- Ecophysiology of Marine Algae
- Ecophysiology of Marine Animals

Module E: Marine Ecology & Biological Oceanography
- Plankton Ecology
- Benthos & Fish Ecology
- Fisheries Biology & Aquaculture

The core of the marine biology curriculum taught in the 2nd term consists of courses in marine ecophysiology of micro-organisms, algae and animals as well as in marine ecology of plankton, benthos and fish. Special focus is also given to applied aspects such as fisheries biology and aquaculture. The high proportion of practical classes offers hands-on training in different fields of marine biology. Students have the opportunity to exercise their skills during a field trip to the Island of Helgoland in the central North Sea.
Third term
Module F: Advanced Studies in Marine Biology

● A wide spectrum of specialist courses is offered including for instance:
  - Marine Phytoplankton under Global Change
  - Trophodynamic interactions
  - Introduction to Ecological Modelling
  - Marine Molecular Biodiversity and its Evolution
  - Marine Microbial Ecology
  - Invertebrate Nutrition

● In addition, Module F includes a field trip, excursion or research cruise of at least 10 days, and

● the Student Research Project

Module G: Project Development & Implementation

● Research Management & Funding Opportunities

● Grant Proposal and Defence

During the 3rd term, students will intensify their studies according to their own interests and intentions. They may choose a series of advanced specialist courses in marine biology from a wide spectrum of topics on offer. Besides the University of Bremen itself, the associated world-class marine research institutions in the Federal State of Bremen, including the Alfred Wegener Institute for Polar and Marine Research (AWI), the Leibniz Center for Tropical Marine Ecology (ZMT) and the Max Planck Institute for Marine Microbiology (MPI), contribute to this unique choice of study opportunities. Students will be integrated in different research teams (lab rotation) and work on burning issues of current marine research, providing them with first-hand experience of scientific work and proficiency in state-of-the-art methodologies.

Alternatively, the flexible structure of the third term enables students to take courses and continue their studies at a university abroad.

At the end of the term, students will develop and defend a proposal for their own research project, which may directly lead to the master thesis in the 4th and final term.
Fourth term
The thesis can be prepared either at a marine biological department of the University of Bremen or at one of the associated marine research institutions.

Research Co-operations
The University of Bremen closely co-operates with research teams at the associated marine research institutions Alfred Wegener Institute for Polar and Marine Research (AWI), Leibniz Center for Tropical Marine Ecology (ZMT) and Max Planck Institute for Marine Microbiology (MPI) as well as other German marine science centres in Oldenburg, Hamburg, Kiel and Rostock-Warnemünde.

The different marine research teams at the University of Bremen as well as those at AWI, ZMT and MPI are members of national, European and international research initiatives including IMBER (Integrated Marine Biogeochemistry and Ecosystem Research).
Limited number of study places
A total of 20 study places is available each year.

Application deadline
April 30th for the course starting in the following winter term

Application procedure
Applications must be submitted online via the central online application portal of the University of Bremen. Submissions by mail or email will not be considered.

Please follow the application procedure as outlined on the web page www.marbiol.uni-bremen.de and www.uni-bremen.de/master

Start of the study programme
We only offer one entry per year, always for the winter term starting in October.

Duration of study
The M.Sc. programme includes 120 ECTS equivalent to four semesters of full-time study.
Degree
Master of Science (M.Sc.) in Marine Biology

Language of instruction
English

Study period abroad
The M.Sc. programme Marine Biology allows for an optional study period abroad, especially in the third semester. Lecturers involved in the programme are members of international research networks and have numerous contacts with international universities and partners.

Number of lecturers
More than 25 professors and lecturers at the University of Bremen and the associated research institutions Alfred Wegener Institute for Polar and Marine Research, Leibniz Center for Tropical Marine Ecology and Max Planck Institute for Marine Microbiology contribute to teaching of the M.Sc. programme Marine Biology and thesis supervision.
Contact and Advisory

Internet address of the study programme
http://www.marbiol.uni-bremen.de

Administration/Academic office (examination issues)
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Student advisory service
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Advice for international students
Information and advice on housing, working, health insurance, visa and more
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Central Student Advisory Service

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Mo, Tue & Thur 9–12 a.m.
Wed 14–16 p.m.
Additional appointments by agreement