



UiT The Arctic University of Norway

PROGRAMME DESCRIPTION

Marine Biotechnology and Biological Chemistry - master

120 credits

Tromsø

The program description has been approved by the Faculty of Science and Technology 03.09.2025.

Study program name	Marine Biotechnology and Biological Chemistry - master
Degree obtained	Master of Science in Marine Biotechnology and Biological Chemistry
Target group	This Master's programme is designed for students with a background in biotechnology, chemistry, molecular biology, or related life sciences, focusing on biological molecules, bioactive compounds, or enzymes, especially from marine organisms. The programme integrates elements of marine biotechnology, biomolecular chemistry and analytical chemistry. The degree is particularly relevant for students who want to contribute to research, innovation or industrial development in areas such as marine bioprospecting, molecular life sciences, natural product chemistry or industrial biotechnology.
Admission requirements, required prerequisite, recommended prerequisite knowledge	The student is eligible according to UiT - The Arctic University of Norway's general admission rules: • General admission requirements - Master. • Admission requires a Bachelor's degree (180 ECTS) in biotechnology, marine biotechnology, molecular biology, biochemistry, chemistry or a related discipline OR an equivalent degree following a programme of study of minimum 3 years (More information on bachelor's degree requirements). • A minimum of 80 ECTS must be within relevant subjects such as chemistry, molecular biology, microbiology, or biotechnology. • Applicants must have a minimum grade average comparable to a Norwegian "C" (3.0) in the ECTS scale, see the UiT webpage for international admissions for more information on how the point average is calculated. • International students from non-Nordic countries (except students with English as their mother tongue), must meet the Department of Chemistry's English proficiency with a recommended minimum score of 6.5 on each part of the IELTS test, minimum scores of 22, 22, 22 and 25 (reading, listening, speaking and writing, respectively) on the TOEFL test, C1 Advanced or C2 Proficiency level on Cambridge ESOL Examinations, or minimum C1 level on The European language certificate (telc)

The study program's learning outcome	Knowledge The candidate... • has advanced knowledge of molecular biology, marine biotechnology and biomolecular chemistry • understands how marine resources can be utilised for biotechnological applications and sustainable value creation • is familiar with techniques used in bioprospecting, industrial biotechnology, protein structure analysis and chemical synthesis • understands the principles of bioinformatics, metagenomics, and microbial genomics relevant to marine and environmental biotechnology • can apply knowledge in new areas within the field • can critically analyse and reflect on scientific theory, methodology, and ethics related to biological resource use and development Skills The candidate... • can apply a range of laboratory and analytical methods, including spectroscopic techniques, chromatographic methods, and computational tools • can isolate, characterise and analyse bioactive compounds and biomolecules from marine sources • can analyse and evaluate scientific data, theories and methodologies within the field • can plan and carry out independent scientific work under supervision, and handle relevant data, literature and sources • can communicate scientific results clearly, both orally and in writings General competence The candidate... • is able to participate in interdisciplinary research and development projects • can critically analyse and discuss scientific, environmental and ethical challenges related to biotechnology and innovation • is able to communicate subject-related issues, analyses, and conclusions within the discipline, both with specialists and with non-specialists • can contribute to knowledge-based innovation in the marine bioeconomy or chemical industry
Academic content and description of the study program	The Master's degree in Marine Biotechnology and Biological Chemistry is a two-year, full-time programme (120 ECTS). The first year focuses on core topics in marine biotechnology, bioactive compounds, molecular biology, and analytical chemistry. The second year is dedicated to elective specialisation and the master's thesis.

	This full-time campus-based programme provides a broad platform in marine bioresources, chemical and structural analysis, and biomolecular applications. The curriculum includes core topics such as: • Marine industrial biotechnology and sustainable processing • Bioassay-guided bioprospecting and analysis of natural compounds • Protein structure, enzymology and molecular interaction • Synthetic chemistry and spectroscopic analysis • Bioinformatics, microbial genomics and metagenomics Students are trained in the use of laboratory and computational tools, and in project work based on real-world research environments. Teaching is closely integrated with research activities, ensuring that students are exposed to current challenges and innovations in the field. Typical applications of marine biotechnology and biological chemistry introduced in the programme include: • Development of bioactive marine compounds • Sustainable utilisation of marine sidestreams • Molecular modelling and structure determination • Genome-based exploration of microbial resources • Applied bioprocessing and upscaling Year 1 – Semester 1 (Autumn): • KJE-3502 Biomolecular structure and modelling (10 ECTS) • BIO-3612 Marine Bioprospecting and Bioactive Compounds (10 ECTS) • BIO-3615 Quantitative Microbial Biotechnology I (10 ECTS) Year 1 – Semester 2 (Spring): • Elective course (10 ECTS) • Elective course (10 ECTS) • KJE-3930- Master's Thesis – part 1 (10 ECTS) Year 2 – Semester 3 (Autumn): • BED-3200 Bærekraft og innovasjon (10 ECTS) • KJE-3960 Master's Thesis – part 2 (20 ECTS) Year 2 – Semester 4 (Spring): • KJE-3960 Master's Thesis – part 3 (30 ECTS)
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	Elective courses include: • KJE-3317 Applied spectroscopical analysis (10 ECTS) • BIO-3610 Industrial Biotechnology (10 ECTS) • BIO-3xxx Bioinformatics II (10 ECTS) • KJE-3320 Advanced Chemical Structure and Reactivity (10 ECTS) Elective courses are selected in consultation with academic advisors and should support the student's thesis topic and academic interests. Up-to-date course descriptions are available online.																				
Program outline	The Master's degree program in Marine Biotechnology and Biological Chemistry at UiT has a duration of 2 years and equals a total of 120 ECTS (Table 2). Each Master's candidate works on a research project to complete an independent scientific dissertation (thesis, 60 ECTS) under supervision. In addition, the programme includes topical coursework, where 40 ECTS are obligatory for all students admitted to the program, and 20 ECTS are to expand on the students chosen discipline and other special curricula (total 60 ECTS). Table 2 Outline for the Master's degree program in Marine Biotechnology and Biological Chemistry. <table><tr><th>Sem</th><th colspan="3">Computational Chemistry</th></tr><tr><td>1st</td><td>BIO-3615 Quantitative Microbial Biotechnology</td><td>BIO-3612 Marine bioprospecting and bioactive compounds</td><td>KJE-3502 Biomolecular structure and modelling</td></tr><tr><td>2nd</td><td colspan="2">Elective course (2 out of 4)* Bio-3610 Industrial biotechnology KJE-3317 Applied spectroscopical analysis Bio-3xxx Bioinformatics II KJE-3320 Advanced Chemical Structure and Reactivity</td><td>Master thesis (10 ECTS)</td></tr><tr><td>3rd</td><td>BED-3200 Bærekraftig innovasjon</td><td colspan="2">Master thesis (20 ECTS)</td></tr><tr><td>4th</td><td colspan="3">Master thesis (30 ECTS)</td></tr></table> *Other relevant master level courses at UiT or other institutions may be approved in advance by the study program board.	Sem	Computational Chemistry			1 st	BIO-3615 Quantitative Microbial Biotechnology	BIO-3612 Marine bioprospecting and bioactive compounds	KJE-3502 Biomolecular structure and modelling	2 nd	Elective course (2 out of 4)* Bio-3610 Industrial biotechnology KJE-3317 Applied spectroscopical analysis Bio-3xxx Bioinformatics II KJE-3320 Advanced Chemical Structure and Reactivity		Master thesis (10 ECTS)	3 rd	BED-3200 Bærekraftig innovasjon	Master thesis (20 ECTS)		4 th	Master thesis (30 ECTS)		
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Learning activities, examination and assessment	Courses are taught as classes or as individual curriculum. Various assessment methods are applied. Courses are assessed through oral or written exams, some through assessment of a laboratory or project report, and some as a combination of methods. Up-to-date course descriptions are available online.																				
The study program's relevance	Marine Biotechnology and Biological Chemistry are central to several emerging sectors, including marine health products, sustainable food systems, and environmental technologies. The programme equips students with practical and theoretical tools needed for research and innovation in these fields.																				

	Graduates may work in biotechnology companies, research institutes, analytical laboratories, governmental agencies or continue to PhD studies. The programme aligns with Norway's national strategies for marine industries, bioeconomy and innovation.
Work scope	Students are expected to engage actively in academic work throughout the programme, including coursework, laboratory exercises, literature studies and scientific writing. Project collaboration and laboratory training are important elements of the learning environment. To achieve the learning outcomes of the programme, students are expected to work on average at least 40 hours per week throughout the year on project and courses, including lectures, lab and seminars.
For master's theses/independent work in master's degrees	The master's thesis (60 ECTS) is an independent scientific dissertation carried out over three semesters under the supervision of academic staff. The work typically takes place within a research group affiliated with the Department of Chemistry or the Norwegian College of Fishery Science. Students are encouraged to get in touch with potential supervisors early in the programme.
Language of instruction and examination	The language of instruction and examination is English, and all syllabus material is in English. The Master's thesis must be written in English.
Internationalisation	The research group, to which the Master's students become members, consist of staff and students of different nationalities. The scientific staff have international collaborators, providing opportunities for obtaining knowledge about the international research frontier through visits, lectures, and workshops by national and international scientists. International collaboration also provides opportunities for research visits abroad.
Student exchange	The Master's program is structured such that the student can spend periods of their study abroad, and students can apply for exchange in the second or third semester. Student exchange can be formal courses, or visits to other labs and institutions to learn new techniques. Formal exchange programs with international Universities exist, (see the study program's web pages for more information). However, visits abroad are generally arranged individually, depending on what is relevant for the Master's project, and on the collaborations of the supervisor. Courses must be approved in advance.
Administrative responsibility and academic responsibility	Administrative responsibility: Faculty of Science and Technology Academic responsibility: Department of Chemistry and Norwegian College of Fishery Science
Quality assurance	The study programme and all courses are evaluated according to the University's quality assurance system . Course evaluations are conducted at least once every three years and involve both student and staff feedback.

Other regulations	Access to laboratories and fieldwork activities requires completed safety training (HMS-0501 and HMS-0504). These modules must be completed early in the first semester Utfyllende bestemmelser for toårig mastergrad (120 studiepoeng) ved Fakultet for naturvitenskap og teknologi Supplementary provisions for the two-year master's degree programme (120 credits) at the Faculty of Science and Technology
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