



Program description

Master of Science in Biomedicine

120 ECTS Tromsø

The program description has been approved by the board of [the Faculty of Health sciences
27th of September 2019.



Study programme name	English: Biomedicine - Master Bokmål: Biomedicine - Master Nynorsk: Biomedicine - Master
Degree obtained	Master of Science in biomedicine
Target group	This program is designed for students who wish to acquire advanced knowledge and primary research skills in human biology and biomedical issues, including specialized technical laboratory skills related to modern cell and molecular biology research activities. The Program is a continuation of the education for students with a completed bachelor degree in biomedicine, or who have a comparable educational background from a university or other institutions of higher education, aiming for careers in research and development, management or teaching.
Admission requirements, required prerequisite, recommended prerequisite knowledge	Admission to the program requires a 3-year bachelor's degree (180 ECTS) or equivalent qualification in Biomedicine. An additional requirement is specialization in biomedical topics (e.g., biochemistry, bioinformatics, cell-and molecular biology, human physiology, immunology, microbiology, or pharmacology) worth a minimum of 80 ECTS. Applicants are expected to have practical laboratory experience in their bachelor's degree. Applicants with a degree in Biomedical laboratory sciences ("Bioingeniør") must have their degree recognized as equivalent to a Norwegian degree in laboratory sciences by NOKUT. Applicants also need authorization with the Norwegian authorization board as a qualified Bioingeniør. Bachelor of Pharmacy, Medicine or Dentistry does not fulfil the admission requirements. Applicants must have a minimum grade average comparable to a Norwegian C (2,5) in the ECTS scale. The average grade is calculated from the entire bachelor's degree. Applicants with education from non-Nordic countries must document English language proficiency.
The study programme's Learning Outcome	When you have completed the Master program in biomedicine, you are expected to have advanced and comprehensive knowledge of biomedical methodology, theories, concepts, and scientific approaches specified by the following learning outcomes: Knowledge • can explain current scientific theories and methods in biomedicine • can discuss the theoretical background, including strengths and weaknesses/ shortcomings, of advanced laboratory

	techniques and methods used in a chosen scientific discipline within biomedicine, based on the candidate's own research • can apply acquired knowledge in new areas within biomedicine • can analyze professional issues, based on the history and traditions of biomedicine and its place in society
	Skills • can analyze and assess different information sources in a critical manner and use these to structure and enunciate professional reasoning • can analyze existing theories and interpretations in biomedicine and work independently with theoretical and practical problem solving • can choose and perform relevant methods to solve specific problems in biomedical research • can design and execute controlled experiments to address specific research questions within the field • perform an independent research project in biomedicine under guidance and in accordance with recognized norms in research ethics • General proficiency • can analyze relevant issues connected with professional ethics and research ethics in biomedicine • can apply knowledge and skills in biomedical theory and methods in new areas in order to implement advanced work tasks and projects • can communicate her/his own scientific work both orally and in writing, using the relevant scientific language • can communicate about professional issues, analyses and conclusions with specialists in the field and to the community in general • can contribute to innovation processes in biomedicine
	General proficiency • can analyze relevant issues connected with professional ethics and research ethics in biomedicine • can apply knowledge and skills in biomedical theory and methods in new areas in order to implement advanced work tasks and projects • can communicate her/his own scientific work both orally and in writing, using the relevant scientific language • can communicate about professional issues, analyses and conclusions with specialists in the field and to the community in general • can contribute to innovation processes in biomedicine

Academic content and description of the study programme	The program will shed light on contemporary problems and methods in biomedicine. Students will be trained in experimental work, as well as written and oral presentations of independent scientific papers. The first semester the students will attend the mandatory course MBI-3012 Advanced methods in experimental biomedicine, where they will be trained in cell culturing, detection and expression of DNA, RNA and proteins, imaging, electron microscopy, histological analysis and immunohistochemistry. Students will also learn health and safety procedures in laboratories, how to cite correctly and get an introduction to innovation. Students must pass this course in order to start working on the master project. In the second semester, students will attend three elective courses where they will specialize in various areas of biomedicine. In the second year (3rd and 4th semester), students will become a member of a research group working with their master project under supervision alongside our researchers. We offer an international research-environment with researchers from all corners of the world. The specialization is chosen according to the project the student will work on. The Master's thesis is expected to be an independent body of scientific work performed and presented by each student.												
Table: programme structure	<table><tr><th>Semester</th><th>10 credits</th><th>10 credits</th><th>10 credits</th></tr><tr><td>1. semester</td><td colspan="3">MBI-3012 Advanced methods in experimental biomedicine (30 ECTS)</td></tr><tr><td>2. semester</td><td colspan="3"> Elective courses (30 ECTS) • MBI-3004 The biology of cancer (10 ECTS) • MBI-3013 Human molecular genetics: medical and forensic genetics (10 ECTS) • MBI-3014 Infection, inflammation and immunity (10 ECTS) • MBI-3015 Human pharmacology and toxicology (10 ECTS) </td></tr></table>	Semester	10 credits	10 credits	10 credits	1. semester	MBI-3012 Advanced methods in experimental biomedicine (30 ECTS)			2. semester	Elective courses (30 ECTS) • MBI-3004 The biology of cancer (10 ECTS) • MBI-3013 Human molecular genetics: medical and forensic genetics (10 ECTS) • MBI-3014 Infection, inflammation and immunity (10 ECTS) • MBI-3015 Human pharmacology and toxicology (10 ECTS)		
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		• MBI-3016 Human physiology (10 ECTS) • KJE-3603 Protein Production technology (10 ECTS) Norwegian students can choose to study abroad this semester (30 ECTS)
	3. semester	MBI-3911 Master thesis in biomedicine (60 ECTS)
	4. semester	
Learning activities, examination and assessment	Course activities consist of different teaching methods. Lectures will give the students an overview of the scientific field and deeper knowledge of selected areas of biomedicine. At seminars students will analyze, discuss, and put their knowledge into relevant contexts. The laboratory exercises will train practical skills, understanding and applications of methods and technology for use in experimental design. During group work students are allowed to discuss subjects for deeper understanding. In the individual tasks, students will use scientific literature to present scientific work orally and in writing. Students will obtain supervision and individual guidance in laboratory practice and scientific writing. Students are also expected to perform independent studies, including curriculum not specified in the scheduled teaching. Courses include coursework requirements that must be passed in order to attend exams. Coursework requirements are set up to prepare students for exams and give them practice in oral presentations, academic writing and problem solving relevant to exams and to meet the professional working life after obtained degree. Information about coursework requirements and exams are explained for each course in the course descriptions in UiTs' course catalogue online. Exams are given as oral-, written- and portfolio exams. Exams are graded A-F and pass/fail. Re-sit exams are provided for students who fail their exam.	
The study programme's relevance	After completing the program, the candidate will be prepared for exciting assignments of research and method development in business, management and research-oriented institutions where the demands for qualified professionals are increasing. Career options may include molecular diagnostics, medical research, fisheries, food processing, public administration, educational institutions at all levels, the pharmaceutical industry, private research	

	and innovation enterprises, technical positions at universities, hospitals and other laboratories.
Work scope	The scope of work expected for one full year of studies, is considered to be between 1500-1800 work hours. Students must expect to work approx. 40 hours a week to achieve the objectives for the program. This includes lectures, labwork, groupwork etc. as well as self-study.
For master's theses/independent work in master's degrees	To start work on the master thesis (MBI-3911) students must have passed the mandatory course MBI-3012 Advanced methods in experimental biomedicine (30 ECTS). Students will be working in one of our research groups with a given task. The master thesis is an individual project. The master thesis has a scope of 60 ECTS, and a timeframe of one year. Students will have individual supervision during their project. The assessment for the course is given on the master's thesis, and students must also present their work to an exam committee, in addition to an oral examination. For more information, we encourage students to read the Supplementary regulations for master's degrees at the Department of Medical Biology.
Language of instruction and examination	English
Internationalisation	The study program is taught in English and admits both Norwegian and international students. All courses are taught in English and use international literature. In this way, students come into contact with the latest research in the original language. Students will conduct their thesis work in one of our research groups consisting of international environments, and the students will be therefore become better equipped for an international professional career. The structure of the program allows the Norwegian students to take the second semester at other universities. For more information, see the section for Student exchange.
Student exchange	The second semester consist of recommended elective courses. It is also possible to spend a semester abroad as an exchange student. UiT and the Department of medical biology have exchange agreements open for master students in biomedicine. Exchange is not optional for international students enrolled in the master program. Master in Biomedicine has the following exchange agreements: • University of Navarra (Spain) • Utrecht University (the Netherlands) • Maastricht University (the Netherlands)

	There are other options with study abroad agreement between UiT and other institutions than those listed. The student advisor for the master program can provide more information regarding both exchange agreements and study abroad agreements.
Administrative responsibility and academic responsibility	The Department of Medical Biology at the Faculty of Health Sciences has the administrative responsibility for the program. The Program Board has the academic responsibility. The Program Board consist of the course leaders, a student representative, the Deputy Head of Department – Head of studies, and the student advisor as the secretary.
Quality assurance	The Program Board has the responsibility to determine the structure of the program and evaluate the content and courses of the program. The evaluation is based on: • Evaluation meeting with the Program Coordinator, the student representatives from each year group and the student advisor. This meeting take place once a semester and in the middle of the semester. Thus, giving the opportunity to do small changes in the semester. • The National Student Survey (Studiebarometeret), which the second-year students answer each year. • Yearly evaluation of the courses with feedback from the students and teachers. • External evaluation is also used to evaluate the program.
Other regulations	For a more descriptive regulations for the master's program, we refer to "Supplementary regulations for master's degrees (120 credits) at the Department of Medical Biology, Faculty of Health Sciences," which was approved by the Teaching Committee of the department 11th of January 2011.

