



AALBORG UNIVERSITET

CURRICULUM FOR THE MASTER'S PROGRAMME IN BIOTECHNOLOGY, 2022

**MASTER OF SCIENCE (MSc) IN ENGINEERING
AALBORG**

[Link to this studyline](#)

Link(s) to other versions of the same line:

[Master of Science \(MSc\) in Engineering \(Biotechnology\), 2017](#)

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§ 1: PREFACE

Pursuant to consolidation Act 778 of August 7, 2019 on Universities (the University Act), the following is established.

The programme also follows the Examination Policies and Procedures incl. the Joint Programme Regulations and for Aalborg University.

§ 2: BASIS IN MINISTERIAL ORDERS

The Master's programme is organised in accordance with the Ministry of Higher Education and Science's Order no. 2285 of December 1, 2021 on Full-time University Programmes (the University Programme Order) and Ministerial Order no. 2271 of December 1, 2021 on University Examinations (the Examination Order). Further reference is made to Ministerial Order no. 104 of January 24, 2021 (the Admission Order) and Ministerial Order no. 114 of February 3, 2015 (the Grading Scale Order).

§ 3: CAMPUS

The programme is offered in Aalborg.

§ 4: FACULTY AFFILIATION

The Master's programme falls under The Faculty of Engineering and Science, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Master's programme falls under Study Board of Chemistry and Bioscience

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The programme falls under the external examiners corps: Civil engineering corps of external examiners.

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal right of admission (retskrav)

Applicants with the following degree are entitled to admission:

- Bachelor of science in Biotechnology, Aalborg University

Applicants without legal right of admission

Additional qualifying programs

- Bachelor of science in Chemical Engineering and Biotechnology, Aalborg University
- Bachelor of engineering in Chemical Engineering and Biotechnology, Biotechnology Aalborg University
- Bachelor of engineering in Chemical Engineering and Biotechnology, Aalborg University, Esbjerg
- Bachelor of science in Sustainable Biotechnology, Aalborg University
- Bachelor of science in kemi og bioteknologi, University of Southern Denmark
- Bachelor of science in bioteknologi, Århus University
- Bachelor of science in bioteknologi, Technical University of Denmark
- Bachelor of engineering in bioteknologi, Århus University
- Bachelor of Engineering (B. Eng.) with specialization in the branch of biotechnology, University College Absalon, Denmark

All applicants without a legal claim must prove that their English language qualifications is equivalent to level B (Danish level) in English.

Admission to the master's programme in Biotechnology, cand.polyt requires that the applicant has passed a relevant qualifying bachelor's or professional bachelor's degree programme. A bachelor's or professional bachelor's degree programme is defined as relevant if the degree programme provides competencies to a minimum of ECTS within the following subject areas:

- Mathematics and statistics (15 ECTS)
- Chemistry, including organic chemistry and physical chemistry (15 ECTS)
- Biotechnology or chemical engineering, including biochemistry, molecular biology, microbiology, cell biology, and process technology (100 ECTS)
- Experimental work in biotechnology, through practice courses, projects, or other activities (20 ECTS)

As a prerequisite for admission to the master's programme, students must have completed a bachelor programme in technical sciences, a bachelor of engineering programme or a bachelor in natural science.

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's program entitles the graduate to the designation *civilingeniør, Civilingeniør, cand.polyt. i bioteknologi*. The English designation is: Master of Science (MSc) in Engineering (Biotechnology).

The Master's program with specialisation in Medical Biotechnology entitles the graduate to the designation *Civilingeniør, cand.polyt. i bioteknologi med specialisering i medicinsk bioteknologi*. The English designation is: Master of Science (MSc) in Engineering (Biotechnology with specialisation in Medical Biotechnology).

§ 9: PROGRAMME SPECIFICATIONS IN ECTS CREDITS

The Master's program is a 2-year, research-based, full-time study program. The program is set to 120 ECTS credits.

§ 10: RULES CONCERNING CREDIT TRANSFER (MERIT), INCLUDING THE POSSIBILITY FOR CHOICE OF MODULES THAT ARE PART OF ANOTHER PROGRAMME AT A UNIVERSITY IN DENMARK OR ABROAD

The Study Board can approve that passed programme elements from other educational programmes at the same level replaces programme elements within this programme (credit transfer).

Furthermore, the Study Board can, upon application, approve that parts of this programme is completed at another university or a further education institution in Denmark or abroad (pre-approval of credit transfer).

The Study Board's decisions regarding credit transfer are based on an academic assessment.

§ 11: EXEMPTIONS

The Study Board's possibilities to grant exemption, including exemption to further examination attempts and special examination conditions, are stated in the Examination Policies and Procedures published at this website:

<https://www.studyservice.aau.dk/rules>

§ 12: RULES FOR EXAMINATIONS

The rules for examinations are stated in the Examination Policies and Procedures published at this website:

<https://www.studyservice.aau.dk/rules>

§ 13: RULES CONCERNING WRITTEN WORK, INCLUDING THE MASTER'S THESIS

In the assessment of all written work, regardless of the language it is written in, weight is also given to the student's formulation and spelling ability, in addition to the academic content. Orthographic and grammatical correctness as well as stylistic proficiency are taken as a basis for the evaluation of language performance. Language performance must always be included as an independent dimension of the total evaluation. However, no examination can be assessed as 'Pass' on the basis of good language performance alone; similarly, an examination normally cannot be assessed as 'Fail' on the basis of poor language performance alone.

The Study Board can grant exemption from this in special cases (e.g., dyslexia or a native language other than Danish).

The Master's Thesis must include an English summary. If the project is written in English, the summary can be in Danish. The summary is included in the evaluation of the project as a whole.

§ 14: REQUIREMENTS REGARDING THE READING OF TEXTS IN A FOREIGN LANGUAGE

It is assumed that the student can read academic texts in English and use reference works, etc., in English and other European languages.

§ 15: COMPETENCE PROFILE ON THE DIPLOMA

The following competence profile will appear on the diploma:

A Candidatus graduate has the following competency profile:

A Candidatus graduate has competencies that have been acquired via a course of study that has taken place in a research environment.

A Candidatus graduate is qualified for employment on the labour market based on his or her academic discipline as well as for further research (PhD programmes). A Candidatus graduate has, compared to a Bachelor, developed his or her academic knowledge and independence so as to be able to apply scientific theory and method on an independent basis within both an academic and a professional context.

§ 16: COMPETENCE PROFILE OF THE PROGRAMME

Knowledge

A Master in Biotechnology has in-depth knowledge of biotechnology. In selected areas, such as cellular and molecular biology, protein biotechnology, bioinformatics, genetic engineering, environmental biotechnology and process technology. The knowledge is based on the latest international research.

- A Master in Biotechnology with specialisation i Medical Biotechnology are particularly knowledgeable in areas relevant to health and medicine.

A Master in Biotechnology is able, on a scientific basis, to understand and contemplate the knowledge in the above-mentioned areas and be able to identify scientific problems.

Skills

A Master in Biotechnology masters the scientific methods and tools of the above-mentioned areas and master the general skills that are central to work within biotechnology.

- A Master in Biotechnology with specialisation i Medical Biotechnology is particularly skilled in applying scientific methods relevant to health and medicine.

A Master in Biotechnology is able to evaluate and select among the scientific theories, methods, tools and general skills of biotechnology, and establish new analysis and solution models on a scientific basis.

A Master in Biotechnology is able to communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists.

Competencies

A Master in Biotechnology is able to carry out research and development in the area of microbiology and microbial products and processes, development and quality analyses of recombinant products, modified proteins and pharmaceutical products, following GLP and GMP principles and proper safety regulations.

A Master in Biotechnology is able to independently initiate and carry out discipline-specific and cross-disciplinary cooperation and to assume professional responsibility within the area of biotechnology.

A Master in Biotechnology is able to independently take responsibility for own professional development and specialization.

A Master in Biotechnology can analyze, identify and formulate problems on a scientific basis and subsequently work problem-oriented on understanding, further developing and finding solutions both individually and in collaboration with other professionals.

A Master in Biotechnology can use digital solutions for data collection and storage, statistical data analysis, data visualization, modeling and simulation, for presentation of theories, hypotheses and results in writing as well as orally, as well as for organizing and implementing collaboration in project groups and with external partners.

A Master in Biotechnology can perform digital search of relevant professional and research literature and knowledge in databases as well as assess the validity of digital sources and use digital platforms for self-study and knowledge sharing as well as for professional discussion and communication.

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The program is structured in modules and organized as a problem-based study. A module is a program element or a group of program elements, which aims to give students a set of professional skills within a fixed time frame specified in ECTS credits, and concluding with one or more examinations within specific exam periods. Examinations are defined in the curriculum.

The program is based on a combination of academic, problem-oriented and interdisciplinary approaches and organized based on the following work and evaluation methods that combine skills and reflection:

- Lectures
- Project work
- Workshops
- Exercises (individually and in groups)
- Teacher feedback

AAU Micro

AAU Micro are small e-learning modules of limited, well-defined scope. AAU Micro modules are extra-curricular but may be employed to support learning in curricular course and project modules.

§ 18: OVERVIEW OF THE PROGRAMME

All modules are assessed through individual grading according to the 7-point scale or Pass/Fail. All modules are assessed by external examination (external grading) or internal examination (internal grading or by assessment by the supervisor only).

Offered as: 1-professional						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Experimental Molecular Cell Biology (K-BT-K1-48)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Applied Molecular Cell Biology (K-BT-K1-60)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Genomics and Bioinformatics (K-BT-K1-61)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Electives 1st semester Select course, 5 ECTS	Course	5				
2 SEMESTER						
Protein Chemistry (K-BT-K2-20A)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Electives 2nd semester, project Select project, 15 ECTS	Project	15				
Electives 2nd semester, courses Select two courses of 5 ECTS	Course	10				
3 SEMESTER						

Option A						
Project-Oriented Study in an External Organisation (K-BT-K3-68A)	Project	30	7-point grading scale	External examination	Oral exam based on a project	English
3-4 SEMESTER Option B						
Master's Thesis (K-KMB-K4-4A)	Project	60	7-point grading scale	External examination	Master's thesis/final project	English
4 SEMESTER						
Master's Thesis (K-KMB-K4-5A)	Project	30	7-point grading scale	External examination	Master's thesis/final project	English

Electives 1st semester Select course, 5 ECTS						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Environmental Biotechnology (K-BT-K1-59)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Chemical and biological experiments for teaching (K-KEM-K1-22)	Course	5	Passed/Not Passed	Internal examination	Active participation/continuous evaluation	Danish

Electives 2nd semester, project Select project, 15 ECTS						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Protein Science (K-BT-K2-38B)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Bioresources and Sustainable Development (K-BT-K2-39)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English

Electives 2nd semester, courses Select two courses of 5 ECTS						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Instrumentation and regulation of processes (K-KEM-B6-49)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	Danish and English
Ecology and Ecotoxicology (K-BIO-B4-24A)	Course	5	7-point grading scale	Internal examination	Written or oral exam	Danish
Protein Structure (K-BT-K2-21)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Bioresources and Biorefineries (K-BT-K2-22)	Course	5	Passed/Not Passed	Internal examination	Active participation/continuous evaluation	English

Offered as: 1-professional						
Specialisation: Medical Biotechnology						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Experimental Molecular Cell Biology (K-BT-K1-48)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Applied Molecular Cell Biology (K-BT-K1-60)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Environmental Biotechnology (K-BT-K1-59)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Genomics and Bioinformatics (K-BT-K1-61)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
2 SEMESTER						
Medical Protein Science (K-BT-K2-41B)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Protein Chemistry (K-BT-K2-20A)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Instrumentation and regulation of processes (K-KEM-B6-49)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	Danish and English
Protein Structure (K-BT-K2-21)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
3 SEMESTER Option A						
Project-Oriented Study in an External Organisation (K-BT-K3-68A)	Project	30	7-point grading scale	External examination	Oral exam based on a project	English
3-4 SEMESTER Option B						
Master's Thesis (K-KMB-K4-4A)	Project	60	7-point grading scale	External examination	Master's thesis/final project	English
4 SEMESTER						
Master's Thesis (K-KMB-K4-5A)	Project	30	7-point grading scale	External examination	Master's thesis/final project	English

Electives

The Master's program gives the student freedom of choice for individual profiling of their education.

- Students who wish to specialize in medical biotechnology can after the 1st semester choose to follow the specialization in medical biotechnology. The project at the 2nd semester and the master's thesis must then be completed within medical biotechnology
- Students who do not follow the specialization in medical biotechnology can profile their education either in molecular biotechnology by following the course in **Protein structure** and **Instrumentation and regulation of processes** and the project in **Protein Science** at 2nd semester.
- Students who do not follow the specialization in medical biotechnology may also profile their education within bioresources, processes and biorefining by following the courses in **Bioresources and Biorefineries** and **Instrumentation and regulation of processes** and the project in **Bioresources and Sustainable Development** at 2nd semester,

- Students, who have followed Aalborg University's course in **Human and Animal Physiology** or equivalent as part of their BSc degree have furthermore the opportunity to shape their study to meet the minimum academic requirements for Danish high school teachers in biotechnology (faglige mindstekrav til gymnasielæreruddannelsen i bioteknologi) if they follow **Chemical and biological experiments for teaching** at the 1st semester and **Ecology and Ecotoxicology** at the 2nd semester (both courses are taught in Danish).

Elective Courses

On 3 - 4 semester option A or B is chosen.

§ 19: ADDITIONAL INFORMATION

All students who have not participated in Aalborg University's PBL introductory course during their Bachelor's degree must attend the introductory course "Problem-based Learning and Project Management". The introductory course must be approved before the student can participate in the project exam. For further information, please see the www.en.bio.aau.dk

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of September 1, 2022.

The Study Board does not offer teaching after the previous curriculum from 2020 after the summer examination examination 2023.

The Study Board will offer examinations after the previous curriculum, if there are students who have used examination attempts in a module without passing. The number of examination attempts follows the rules in the Examination Order.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

On November 14, 2022, the Vice-Dean of Education has approved, that the assessment method has changed to "written or oral exam" in the following modules:

- Instrumentation and regulation of processes
- Environmental Biotechnology

The amendment is valid from spring 2023.

The Vice-dean has on November 24, 2023, approved an addition of Micro Modules in section 17, valid from spring 2024.