AALBORG UNIVERSITET

MASTER OF SCIENCE (MSC) IN ENGINEERING (BIOTECHNOLOGY), 2020

MASTER OF SCIENCE (MSC) IN ENGINEERING AALBORG

Link to this studyline

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

Curriculum for the Master's Programme in Biotechnology, 2022

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 Joint Programme Regulations and the Examination Policies and Procedures 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. 20 of January 9, 2020 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) and Ministerial Order no. 22 of January 9, 2020 on University Examinations (the Examination Order). Further reference is made to Ministerial Order no. 153 of February 26, 2020 (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 evaluator corps: Ingeniøruddannelsernes landsdækkende censorkorps – kemi.

§ 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 Egnineering and Biotechnology, Biotechnology Aalborg University
- Bachelor of engineering in Chemical Egnineering 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
- Bachelorof engineering in bioteknologi, Århus University

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

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's program entitles the graduate to the designation civilingeniør, cand.polyt. (candidatus/candidata polytechnices) 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. (candidatus/candidata polytechnices) 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

The graduate of the Master's programme:

Knowledge

- Has in-depth knowledge of biotechnology. In selected areas, such as cellular and molecular biology, protein biotechnology, bioinformatics and genetic engineering, knowledge is based on the latest international research.
- 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

- Master the scientific methods and tools of the above-mentioned areas and master the general skills that are central to work within 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.
- Is able to communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists.

Competencies

- 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.
- Is able to independently initiate and carry out discipline-specific and cross-disciplinary cooperation and to assume professional responsibility within the area of biotechnology.
- Is able to independently take responsibility for own professional development and specialization.

The graduate of the Master's program with specialization in medical biotechnology:

Knowledge

- Has in-depth knowledge of biotechnology and medical biotechnology. In selected areas, such as cellular and molecular biology, protein biotechnology, bioinformatics and genetic engineering, knowledge is based on the latest international research.
- 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

- Master the scientific methods and tools of the above-mentioned areas and master the general skills that are central to work within medical 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.
- Is able to communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists.

Competencies

- 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.
- Is able to independently initiate and carry out discipline-specific and cross-disciplinary cooperation and to assume professional responsibility within the area of medical biotechnology.
- Is able to independently take responsibility for own professional development and specialization.

§ 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 Biology (K-BT-K1-47A)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	Danish and English
Molecular Biology and Bioinformatics (K-BT-K1-24)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Cell Biology, Immunology and Genetics (K-BT-K1-5)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Microbial Diversity and Activity (K-BT-K1-22)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
2 SEMESTER						
Protein Science (K-BT-K2-38A)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Protein Chemistry (K-BT-K2-20)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Protein Structure (K-BT-K2-21)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Carbohydrate Chemistry (K-BT-K2-9)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
3 SEMESTER Option A						
Project-Oriented Study in an External Organisation	Project	30	Passed/Not Passed	External examination	Oral exam based on a project	Danish and English

(K-BT-K3-68)						
4 SEMESTER						
Master's Thesis (K-KMB-K4-5)	Project	30	7-point grading scale	External examination	Master's thesis/final project	English
3-4 SEMESTER Option B						
Master's Thesis (K-KMB-K4-4)	Project	60	7-point grading scale	External examination	Master's thesis/final project	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 Biology (K-BT-K1-47A)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	Danish and English
Molecular Biology and Bioinformatics (K-BT-K1-24)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Cell Biology, Immunology and Genetics (K-BT-K1-5)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Microbial Diversity and Activity (K-BT-K1-22)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
2 SEMESTER						
Medical Protein Science (K-BT-K2-41A)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Protein Chemistry (K-BT-K2-20)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Protein Structure (K-BT-K2-21)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Carbohydrate Chemistry (K-BT-K2-9)	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-K3-68)	Project	30	Passed/Not Passed	External examination	Oral exam based on a project	Danish and English
4 SEMESTER						
Master's Thesis (K-KMB-K4-5)	Project	30	7-point grading scale	External examination	Master's thesis/final project	English
3-4 SEMESTER Option B						
Master's Thesis (K-KMB-K4-4)	Project	60	7-point grading scale	External examination	Master's thesis/final project	English

All modules in the Master's degree programme are taught in English.

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 course "Problem-based learning" or PBL introductory course during their undergraduate education 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, 2020.

The Study Board does not offer teaching after the previous curriculum from 2017 after the summer examination examination 2021.

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

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