



AALBORG UNIVERSITET

# **MASTER OF SCIENCE IN ENGINEERING (NANOBIOTECHNOLOGY), 2017**

MASTER OF SCIENCE (MSc) IN ENGINEERING  
AALBORG

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[Master of Science \(MSc\) in Engineering \(Nanobiotechnology\) 2020](#)

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## § 1: PREFACE

Pursuant to Act 261 of March 18, 2015 on Universities (the University Act) with subsequent changes, the following curriculum is established. The programme also follows the Joint Programme Regulations and the Examination Policies and Procedures for The Faculty.

## § 2: BASIS IN MINISTERIAL ORDERS

The Master's programme is organised in accordance with the Ministry of Higher Education and Science's Ministerial Order no. 1328 of November 15, 2016 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) and Ministerial Order no. 1062 of June 30, 2016 on University Examinations (the Examination Order) with subsequent changes. Further reference is made to Ministerial Order no. 258 of March 18, 2015 (the Admission Order) and Ministerial Order no. 114 of February 3, 2015 (the Grading Scale Order) with subsequent changes.

## § 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 Mechanical Engineering and Physics

## § 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme is associated with the external examiners corps on Nationwide engineering examiners/Mathematics, Physics and Social Studies (Basic Courses).

(Ingeniørernes landsdækkende censorkorps mat,fys,samf).

## § 7: ADMISSION REQUIREMENTS

### Applicants with a legal right of admission (retskrav)

- Bachelor of Science (BSc) in Engineering (Nanotechnology with specialisation in Biotechnology), Aalborg University

### Applicants without legal right of admission

- Bachelor of Engineering in Nanotechnology, Aalborg University

## § 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's programme entitles the graduate to the Danish designation Civilingeniør, cand.polyt. i nanobioteknologi. The English designation is: Master of Science (MSc) in Engineering (Nanobiotechnology).

## § 9: PROGRAMME SPECIFICATIONS IN ECTS CREDITS

The Master's programme is a 2-year, research-based, full-time study programme. The programme 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.studieservice.aau.dk/regler-vejledninger>

## § 12: RULES FOR EXAMINATIONS

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

<https://www.studieservice.aau.dk/regler-vejledninger>

## § 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

At programmes that are taught in Danish, it is assumed that the student can read academic texts in modern Danish, Norwegian, Swedish, and English and use reference works, etc., in other European languages. At programmes taught in English, it is assumed that the student can read academic texts and use reference works, etc., in English.

## § 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

Students graduating with a degree in Nanobiotechnology have acquired the following knowledge, skills and competencies:

### Knowledge

- has knowledge in the major areas within nanobiotechnology that covers advanced gene technology, reaction engineering, high throughput systems, molecular electronics, molecular simulations, self-assembling systems, reaction at interfaces, and spectroscopic methods such as MS and NMR
- can understand and reflect over theory, methods and experiments within the mentioned areas

### Skills

- should be able to apply up-to-date methods to describe and solve problems on a scientific level within nanobiotechnology
- can evaluate problems and select among the scientific theories, methods, tools and general skills within the mentioned areas in order to find a solution based on a scientific analyses

- can communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists

### Competencies

- can manage work and development situations that are complex, unpredictable and require new solutions
- can independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility
- can independently take responsibility for own professional development and specialization

## § 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The program is structured in modules and organised 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 that are defined in the curriculum.

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

- lectures
- classroom instruction
- project work
- workshops
- exercises (individually and in groups)
- teacher feedback
- reflection
- portfolio work

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).

## § 18: OVERVIEW OF THE PROGRAMME

Offered as: 1-professional						
Study programme: Nanobiotechnology						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
<b>1 SEMESTER</b>						
<a href="#">Nanobioengineering</a> (F-NB-K1-1)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
<a href="#">Advanced Gene Technology</a> (F-NB-K1-2)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
<a href="#">Reaction Engineering and Molecular Electronics</a> (F-NB-K1-3)	Course	5	7-point grading scale	Internal examination	Oral exam	English
<a href="#">Molecular Simulations</a> (F-NB-K1-4)	Course	5	Passed/Not Passed	Internal examination	Active participation/continuous evaluation	English
<b>2 SEMESTER</b>						

<a href="#">Characterisation of Nanostructures</a> (F-NB-K2-1)	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
<a href="#">Self-Assembling Systems</a> (F-NB-K2-2)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
<a href="#">Physics and Chemistry of Surfaces</a> (F-FYS-K2-5)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
<a href="#">NMR and MS</a> (K-BT-B6-14)	Course	5	7-point grading scale	Internal examination	Written or oral exam	Danish
<b>3 SEMESTER</b> Elective track A						
<a href="#">Advanced Nanobiotechnology (15 ECTS)</a> (F-NB-K3-5)	Project	15	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Elective courses on 3'rd semester</a>	Course	15				
<b>3 SEMESTER</b> Elective track B						
<a href="#">Advanced Nanobiotechnology (20 ECTS)</a> (F-NB-K3-2)	Project	20	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Elective courses on 3'rd semester</a>	Course	10				
<b>3 SEMESTER</b> Elective track C						
<a href="#">Advanced Nanobiotechnology (25 ECTS)</a> (F-NB-K3-4)	Project	25	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Elective courses on 3'rd semester</a>	Course	5				
<b>3 SEMESTER</b> Elective track D						
<a href="#">Advanced Nanobiotechnology (30 ECTS)</a> (F-NB-K3-1)	Project	30	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<b>3 SEMESTER</b> Elective track E						
<a href="#">Academic Internship (30 ECTS)</a> (F-FYS-K3-4)	Project	30	7-point grading scale	Internal examination	Oral exam based on a project	Danish
<b>3-4 SEMESTER</b> Elective track A						
<a href="#">Master's Thesis (45 ECTS)</a> (F-NB-K3-7)	Project	45	7-point grading scale	External examination	Oral exam based on a project	English
<a href="#">Elective courses on 3'rd semester</a>	Course	15				
<b>3-4 SEMESTER</b> Elective track B						

<a href="#">Master's Thesis (50 ECTS)</a> (F-NB-K3-6)	Project	50	7-point grading scale	External examination	Oral exam based on a project	English
<a href="#">Elective courses on 3'rd semester</a>	Course	10				
<b>3-4 SEMESTER</b> Elective track C						
<a href="#">Master's Thesis (60 ECTS)</a> (F-NB-K3-3)	Project	60	7-point grading scale	External examination	Oral exam based on a project	English
<b>4 SEMESTER</b>						
<a href="#">Master's Thesis (30 ECTS)</a> (F-NB-K4-1)	Project	30	7-point grading scale	External examination	Oral exam based on a project	English

The project on the 3'rd semester can either be a normal semester project of up to 30 ECTS or can be combined with the Master's Thesis to a Long Master's Thesis. In case of a separate project, the scope of the project can vary between 15, 20, 25, and 30 ECTS dependent on how many elective courses are chosen by the student. A Long Master's Thesis can vary between 45, 50, and 60 ECTS dependent on how many elective courses are taken by the student.

Students on the 3'rd semester have also the possibility to study at another Danish or international university (go abroad), as well as they can spend the semester at a company performing an academic internship. Studying at another university (including universities abroad), an academic internship at a company, and a Long Master's Thesis need to be approved by the board of studies.

Projects on 3'rd semester						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
<a href="#">Advanced Nanobiotechnology (15 ECTS)</a> (F-NB-K3-5)	Project	15	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Advanced Nanobiotechnology (20 ECTS)</a> (F-NB-K3-2)	Project	20	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Advanced Nanobiotechnology (25 ECTS)</a> (F-NB-K3-4)	Project	25	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Advanced Nanobiotechnology (30 ECTS)</a> (F-NB-K3-1)	Project	30	Passed/Not Passed	Internal examination	Oral exam based on a project	English
<a href="#">Academic Internship (30 ECTS)</a> (F-FYS-K3-4)	Project	30	7-point grading scale	Internal examination	Oral exam based on a project	Danish

Elective courses on 3'rd semester						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
<a href="#">Materials Characterization</a> (M-MN-K1-2)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English

<a href="#">Materials Chemistry</a> (K-KEM-K1-20)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
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Master's Thesis						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
<a href="#">Master's Thesis (45 ECTS)</a> (F-NB-K3-7)	Project	45	7-point grading scale	External examination	Oral exam based on a project	English
<a href="#">Master's Thesis (50 ECTS)</a> (F-NB-K3-6)	Project	50	7-point grading scale	External examination	Oral exam based on a project	English
<a href="#">Master's Thesis (60 ECTS)</a> (F-NB-K3-3)	Project	60	7-point grading scale	External examination	Oral exam based on a project	English

## § 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 School of Engineering and Science' website.

## § 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of 1<sup>st</sup> September 2017.

Students who wish to complete their studies under the previous curriculum from 2016 must conclude their education by the summer examination period 2018 at the latest, since examinations under the previous curriculum are not offered after this time.

## § 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

The Pro-dean has on March 23, 2020, approved that the module "*Test and Validation*" is no longer offered as an elective from September 2020.

The Pro-dean has on March 27, 2020 approved the following valid from autumn 2020:

- The module "*Synthesis and Characterisation*" is replaced by the module "*Materials Characterization*"

On July 14 the Pro Dean of Education has approved the following changes to the module "Physics and Chemistry of Surfaces":

- The type of exam is changed from "oral" to "written or oral"
- There will be prerequisites for enrollment for the exam

The exemption is valid from September 2021.