AALBORG UNIVERSITET

MASTER OF SCIENCE IN ENGINEERING (NANOMATERIALS AND NANOPHYSICS), 2017

MASTER OF SCIENCE (MSC) IN ENGINEERING
AALBORG

Link to this studyline

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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 Physics), 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 nanomaterialer og nanofysik. The English designation is: Master of Science (MSc) in Engineering (Nanomaterials and Nanophysics).

§ 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 successfully completed (passed) programme elements from other Master's programmes in lieu of programme elements in this programme (credit transfer). The Study Board can also approve successfully completed (passed) programme elements from another Danish programme or a programme outside of Denmark at the same level in lieu of programme elements within this curriculum. Decisions on credit transfer are made by the Study Board based on an academic assessment. See the Joint Programme Regulations for the rules on credit transfer.

§ 11: EXEMPTIONS

In exceptional circumstances, the Study Board study can grant exemption from those parts of the curriculum that are not stipulated by law or ministerial order. Exemption regarding an examination applies to the immediate examination.

§ 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/Studielegalitet/

§ 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 (or another foreign language: French, Spanish or German upon approval by the Study Board). If the project is written in English, the summary must be in Danish (The Study Board can grant exemption from this). The summary must be at least 1 page and not more than 2 pages (this is not included in any fixed minimum and maximum number of pages per student). 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

The graduate of the Master's programme

Knowledge

- within selected areas have knowledge that is based on the highest international research level, for instance in fields like solid state physics, optics, semiconductor physics, surfaces and interfaces, properties of materials and components on the nanoscale
- on a scientific level be able to understand and reflect over theory, methods and experiments within the mentioned areas

Skills

- can use basic scientific methods and tools within the field of physics and materials science
- can be able to select appropriate theories, methods and tools to solve practical problems

- can communicate research-based knowledge and discuss professional scientific problems both with 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: Nanomaterials and Nanophysics					
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method
1 SEMESTER					
Characterisation and Synthesis (Project)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project
Materials Chemistry	Course	5	7-point grading scale	Internal examination	Written or oral exam
Synthesis and Characterisation (course module)	Course	5	Passed/Not Passed	Internal examination	Active participation and/or written assignment
Semiconductors: Physics, Devices and Engineering	Course	5	7-point grading scale	Internal examination	Written or oral exam
2 SEMESTER					

Functional Nanostructures	Project	15	7-point grading scale	Internal examination	Oral exam based on a project
Optical Nanostructures and Materials	Course	5	Passed/Not Passed	Internal examination	Written or oral exam
Computational Modeling for Physics and Engineering	Course	5	Passed/Not Passed	Internal examination	Written exam
Physics and Chemistry of Surfaces	Course	5	7-point grading scale	Internal examination	Oral exam
3 SEMESTER Elective track A					
Advanced Applications of Nanotechnology (15 ECTS)	Project	15	Passed/Not Passed	Internal examination	Oral exam based on a project
Elective courses on 3'rd semester	Course	15			
3 SEMESTER Elective track B					
Advanced Applications of Nanotechnology (20 ECTS)	Project	20	Passed/Not Passed	Internal examination	Oral exam based on a project
Elective courses on 3'rd semester	Course	10			
3 SEMESTER Elective track C					
Advanced Applications of Nanotechnology (25 ECTS)	Project	25	Passed/Not Passed	Internal examination	Oral exam based on a project
Elective courses on 3'rd semester	Course	5			
3 SEMESTER Elective track D					
Advanced Applications of Nanotechnology (30 ECTS)	Project	30	Passed/Not Passed	Internal examination	Oral exam based on a project
3 SEMESTER Elective track E					
Academic Internship (30 ECTS)	Project	30	7-point grading scale	Internal examination	Oral exam based on a project
3-4 SEMESTER Elective track A					
Master's Thesis (45 ECTS)	Project	45	7-point grading scale	External examination	Oral exam based on a project
Elective courses on 3'rd semester	Course	15			
3-4 SEMESTER Elective track B					
Master's Thesis (50 ECTS)	Project	50	7-point grading scale	External examination	Oral exam based on a project
Elective courses on 3'rd semester	Course	10			
3-4 SEMESTER Elective track C					
Master's Thesis (60 ECTS)	Project	60	7-point grading scale	External examination	Oral exam based on a project
4 SEMESTER					

Master's Thesis (30 ECTS)	Project	30	7-point grading scale	External examination	Master's thesis/final project

The project on the 3'rd semester can either be 15, 20, 25 or 30 ECTS, dependent on how many elective courses are chosen. The project on the 3rd semester can also be extended to become a Long Master's Thesis which goes over 2 semesters and will thereby be equal to 60 ECTS. The Long Master's thesis can also be combined with 2 or 3 elective courses, which means that a Long Master's thesis can either be 45, 50, or 60 ECTS if no elective courses are chosen.

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
Advanced Applications of Nanotechnology (30 ECTS)	Project	30	Passed/Not Passed	Internal examination	Oral exam based on a project
Advanced Applications of Nanotechnology (25 ECTS)	Project	25	Passed/Not Passed	Internal examination	Oral exam based on a project
Advanced Applications of Nanotechnology (20 ECTS)	Project	20	Passed/Not Passed	Internal examination	Oral exam based on a project
Advanced Applications of Nanotechnology (15 ECTS)	Project	15	Passed/Not Passed	Internal examination	Oral exam based on a project
Academic Internship (30 ECTS)	Project	30	7-point grading scale	Internal examination	Oral exam based on a project

Elective courses on 3'rd semester

Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method
Test and Validation	Course	5	Passed/Not Passed	Internal examination	Written and oral exam
Reaction Engineering and Molecular Electronics	Course	5	7-point grading scale	Internal examination	Oral exam
Modern Physics	Course	5	7-point grading scale	Internal examination	Oral exam

Master's Thesis (long)

Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method
Master's Thesis (60 ECTS)	Project	60	7-point grading scale	External examination	Oral exam based on a project
Master's Thesis (50 ECTS)	Project	50	7-point grading scale	External examination	Oral exam based on a project
Master's Thesis (45 ECTS)	Project	45	7-point grading scale	External examination	Oral exam based on a project

§ 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 adn Science' website.

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of 1'st 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