AALBORG UNIVERSITET

MASTER OF SCIENCE (MSC) IN ENGINEERING (MATERIALS TECHNOLOGY) 2019

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 (Materials Technology) 2016
Master of Science (MSc) in Engineering (Materials Technology) 2017

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§ 1: PREFACE

Pursuant to consolidation Act 172 of February 27, 2018 on Universities (the University Act) with subsequent changes, the following curriculum for the Master's program in Materials Technology is stipulated. The programme also follows the Joint Programme Regulations and the Examination Policies and Procedures for the The Faculty of Engineering and Science.

§ 2: BASIS IN MINISTERIAL ORDERS

The Master's programme is organised in accordance with the Ministry of Higher Education and Science's Order no. 1328 of November 15, 2016 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) with subsequent changes 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. 106 of February 12, 2018 (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 The Faculty of Engineering and Science, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Master's programme falls under the 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/Machine.

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal right of admission (retskrav):

- Aalborg University offers no bachelor's programmes with a legal right of admission to this Master's program

Applicants without legal right of admission:

Applicants with the following bachelor's degree are entitled to admission:

- Bachelor of Engineering in Mechanical Engineering and Manufacturing, Aalborg University
- Bachelor of Science (BSc) in Engineering (Nanotechnology with specialisation in Physics), Aalborg University
- Bachelor of Science (BSc) in Physics, Aalborg University
- Bachelor of Science (BSc) in Chemistry, Aalborg University
- Bachelor of Engineering in Mechanical Engineering and Industry, Aalborg University
- 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 materialeteknologi. The English designation is: Master of Science (MSc) in Engineering (Materials Technology).

§ 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

It is assumed that the student can read academic texts in his or her native language as well as in English and use reference works etc. in 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 attained thorough understanding of a broad range of theoretical and experimental techniques within the area of Materials Technology.

- Has knowledge in several subject areas based on the highest international research level, within the field of materials technology.
- Can understand and, on a scientific basis, reflect over subject area's related to materials technology and identify scientific problems within that area.
- Demonstrate an understanding of research work and be able to become a part of the research environment.
- Demonstrate insight into the implications of research work, including research ethics.

Skills

- Be able to apply scientific methodology to solve a wide variety of problems within the field of specialization.
- Be able to perform scientific work in relevant topics of the field of specialization.
- Be able to apply a wide range of engineering methods in research and development projects in the field of specialization.
- Be able to participate in or lead projects in materials technology, materials selection, product development, and production technology.
- Can communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists.
- Can use advanced laboratory equipment test set ups and data collection methods.

Competencies

- Be able to work independently with a project on a specific problem within their field of interest on the highest possible level within their specialization.
- Be able to take part in technical development and research.
- Can manage work and development situations that are complex, unpredictable and require new solutions within the area of materials technology.
- Be able to analyse and evaluate the influence of material structure and processing method on the material properties.
- Can independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility.
- Be able to direct the technical management of development projects within the industry.
- Be competent to solve new and complicated technical problems by the use of advanced mathematics, scientific and technological knowledge.
- Can independently take responsibility for own professional development and specialization.

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The Master's programme in Materials Technology aims at educating graduates, who are qualified to take part in technical development and research and who are able to direct the technical management of development projects within the industry.

The graduates are expected to have gained a broad knowledge within the areas of Materials Technology. The graduates have knowledge about qualified materials selection, materials behavior to external stimuli, influence of processing on material properties and material microstructure, metallurgy, issues related to polymer chemistry, various material testing methods and simulation of material behavior.

The programme is structured in modules and organized as a problem-based study. A module is a programme element or a group of programme 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 programme 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
- classroom instruction
- project work

- workshops
- exercises (individually and in groups)
- teacher feedback
- reflection
- portfolio work

§ 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
1 SEMESTER					
Metallic Materials	Project	15	7-point grading scale	External examination	Oral exam based on a project
Courses on the first semester for students with a Bachelor in Mechanical Engineering and Manufacturing or the like	Course	15			
Courses on the first semester for students with other Bachelor's degree	Course	15			
2 SEMESTER					
Polymers and Polymer Composites	Project	15	7-point grading scale	External examination	Oral exam based on a project
Courses on the second semester for students with a Bachelor in Chemistry	Course	15			
Courses on the second semester for students with other bachelor's degree	Course	15			
3 SEMESTER Elective track A					
Industrial Development	Project	30	7-point grading scale	Internal examination	Oral exam based on a project
3 SEMESTER Elective track B					
Project Oriented Study in an External Organisation	Project	30	7-point grading scale	Internal examination	Oral exam based on a project
4 SEMESTER					
Master's Thesis	Project	30	7-point grading scale	External examination	Master's thesis/final project

The students are given options in the project modules as they can select among different projects within the same general theme. Moreover, the projects on the 3rd and 4th semester can be selected freely within the field of Materials Technology.

During the 1st semester, students with a Bachelor of Engineering in Mechanical Engineering and Manufacturing, Aalborg University, or the like, follows the course Solid Mechanics with Microstructures, the rest follows the course Continuum Mechanics. During the 2nd semester, students with a Bachelor of Science (BSc) in Chemistry follows the course Polymer Chemistry, the rest follows Fundamental Polymer Chemistry.

The 3rd semester offers different ways of organisation – depending on the student's choice of content; project work at Aalborg University, study visit at an educational institution in Denmark or abroad, Project Oriented Study in an External Organisation at a company in Denmark or abroad, or a semester programme that comprises cross-disciplinary programme elements composed by the student. The total work load of the semester has to be equivalent to 30 ECTS. The project may be finalized with a project report or in the form of a scientific paper.

Courses on the first semester

Courses on the first semester for students with a Bachelor in Mechanical Engineering and Manufacturing or the like					
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method
Metals and Alloys	Course	5	7-point grading scale	Internal examination	Written or oral exam
Solid Mechanics with Microstructure	Course	5	7-point grading scale	Internal examination	Written or oral exam
Fracture Mechanics and Fatigue	Course	5	7-point grading scale	Internal examination	Written or oral exam

Courses on the first semester for students with other Bachelor's degree					
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method
Metals and Alloys	Course	5	7-point grading scale	Internal examination	Written or oral exam
Continuum Mechanics	Course	5	7-point grading scale	Internal examination	Written or oral exam
Fracture Mechanics and Fatigue	Course	5	7-point grading scale	Internal examination	Written or oral exam

Courses on the second semester

Courses on the second semester for students with a Bachelor in Chemistry					
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method
Simulation and Measuring of Materials Behavior	Course	5	Passed/Not Passed	Internal examination	Written or oral exam
Polymers and Composite Materials	Course	5	7-point grading scale	Internal examination	Written or oral exam
Polymer Chemistry	Course	5	7-point grading scale	Internal examination	Written or oral exam

Courses on the second semester for students with other bachelor's degree					
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method

Fundamental Polymer Chemistry	Course	5	7-point grading scale	Internal examination	Written or oral exam
Simulation and Measuring of Materials Behavior	Course	5	Passed/Not Passed	Internal examination	Written or oral exam
Polymers and Composite Materials	Course	5	7-point grading scale	Internal examination	Written or oral exam

§ 19: ADDITIONAL INFORMATION

The current version of the curriculum is published on the Board of Studies' website, including more detailed information about the programme, including exams.

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. Further information about the introductory course can be found at the homepage of the study board of materials and production, https://www.mp.aau.dk/study-board.

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the Dean of the Faculty of Engineering and Science and enters into force as of September 2019.

The Study Board does not offer teaching after the previous curriculum from 2017 after the summer examination 2020.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

Minor editorial changes have been made in connection with digitisation of the study curriculum.