AALBORG UNIVERSITET

CURRICULUM FOR THE MASTER'S PROGRAMME IN MECHANICAL DESIGN, 2017, VERSION 2

MASTER OF SCIENCE (MSC) IN ENGINEERING
ESBJERG

Link to this studyline

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

Curriculum for the Master’s Programme in Mechanical Design

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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 for the Master's programme in Mechanical Design is stipulated. The programme also follows the Joint Programme Regulations and the Examination Policies and Procedures for 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. 1061 of June 30, 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). 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 Master's programme is offered in Esbjerg.

§ 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 Built Environment.

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme falls under the external examiners corps on Nationwide engineering examiners/Machine.

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal right of admission (retskrav)
Applicants with the following degree are entitled to admission:

- Bachelor of Science (BSc) in Engineering (Mechanical Design), Aalborg University

Applicants without legal right of admission
Bachelor's programmes qualifying students for admission:

- Bachelor of Science (BSc) in Engineering (Mechanical Engineering and Manufacturing). Aalborg University
- Bachelor of Science in Mechanical Engineering, DTU
- Bachelor of Engineering in Mechanical Engineering. Aalborg University, Aalborg
- Bachelor of Engineering in Mechanical Engineering. Aalborg University, Esbjerg
- Bachelor of Engineering in Mechanical Engineering, SDU
- Bachelor of Engineering in Mechanical Engineering, Aarhus University
- Bachelor of Engineering in Mechanical Engineering, DTU
- Bachelor of Engineering in Mechanical Engineering, VIA University College

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's program entitles the graduate to the designation Civilingeniør, cand.polyt. i maskinkonstruktion. The English designation is: Master of Science (MSc) in Engineering (Mechanical Design).

§ 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 by the faculty on their website.

§ 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 text 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

Knowledge

Has knowledge in one or more subject areas that is based on the highest international research within the fields of mechanical and offshore engineering, such as:

- structural behaviour of mechanical and/or offshore structures regarding the static as well as the dynamic response
- structure-fluid interaction,
- construction materials regarding their mechanical behaviour and modelling
- loads, especially environmental loads like wind and wave loads, and methods for their evaluation
- risk and reliability in engineering including uncertainties of loads, geometry, material properties, structural response and computational models

Can select and explain appropriate analytical, numerical and experimental methods for analysis and design of mechanical and/or offshore structures

Skills

Excels in the scientific methods and tools as well as general skills related to employment within mechanical and offshore engineering, such as

- applying appropriate methods of analysis for investigating mechanical structures and construction materials
- assessing loads on mechanical structures, including environmental loading from wind and waves
- assessing the uncertainty connected with structural analysis, and judge the quality of the results
- applying experimental tests for obtaining material properties, calibrating computational models and assess uncertainties within the fields of mechanical and offshore engineering.
- can identify scientific problems within mechanical and offshore engineering and select and apply proper scientific theories, methods and tools for their solution
- can select and apply appropriate methods for solving a given problem within mechanical and offshore engineering and judge the results regarding their accuracy and validity
- can select and apply appropriate computational and experimental methods to investigate the static and dynamic response of mechanical structures
- can communicate research-based knowledge and discuss professional and scientific problems with peers as well as non-specialists, using the correct terminology in mechanical and offshore engineering

Competencies

- Can manage work-related situations that are complex and unpredictable, and which require new solutions
- Can develop and advance new analyses and solutions within mechanical and offshore engineering
- Can initiate and implement discipline-specific as well as interdisciplinary cooperation and assume professional responsibility
- Can take responsibility for own professional development and specialisation

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

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. Examinations 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
- study groups
- exercises (individually and in groups)
- laboratory tests
- measurements and testing in the field
- teacher feedback
- reflection
- portfolio work
- independent study

The modules are evaluated either through written or oral exams as stated in the description of the modules.

For individual written exams the study board selects among the following possibilities:

- Written exam based on handed out exercises
- Multiple choice
- Ongoing evaluation of written assignments

For individual oral exams the study board selects among the following possibilities:

- Oral exam with or without preparation
- Oral exam based on project report (individually graded through group exam)
- Oral exam based on presentation seminar
- Portfolio based oral exam

If the number of students following a module is small and/or if the number of students having to attend a re-exam is small the study board can decide that an exam is conducted either as an oral or written individual exam for economic reasons. In the first case decision must be notified before the start of the teaching activity, in the latter case the students must be notified when the examination date is decided.

1st to 4th semesters of the programme are taught in English and projects are to be written in English. However, the programme can be taught in Danish if no international students are enrolled.

§ 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).

Of a total of 120 ECTS, 120 ECTS are assessed by the 7-point scale and 45-75 ECTS are assessed by external examination.

The students are given options in the project modules as they can select among different projects within the same general theme. Moreover, the master's thesis on the 4th semester can be selected freely within the field of water and environment.

The study board of civil engineering can decide, that the contents of a course module on a semester is taught in the project module in the same semester, by increasing the ECTS extend of the project module by the same number of ECTS. The decision is taken regarding to capacity and/or economy.

Offered as: Study programme: Mechanical Design					
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method
1 SEMESTER					
Stiffness Analysis of Load-Bearing Structures	Project	10	7-point grading scale	Internal examination	Oral exam based on a project
Introduction to Problem Based Learning within Structural and Mechanical Engineering	Project	5	7-point grading scale	Internal examination	Oral exam based on a project
Structural Mechanics and Dynamics	Course	5	7-point grading scale	Internal examination	Written or oral exam
Fluid and Water Wave Dynamics	Course	5	7-point grading scale	Internal examination	Written or oral exam
Material Modelling in Mechanical Design	Course	5	7-point grading scale	Internal examination	Written or oral exam
2 SEMESTER					
Offshore Structures	Project	15	7-point grading scale	External examination	Oral exam based on a project
Coastal, Offshore and Port Engineering	Course	5	7-point grading scale	Internal examination	Written or oral exam
Risk and Reliability in Engineering	Course	5	7-point grading scale	Internal examination	Written or oral exam
Advanced Structural Engineering	Course	5	7-point grading scale	Internal examination	Written or oral exam
3 SEMESTER Version A					
Analysis and Solution of Advanced Mechanical and/or Offshore Engineering Problems	Project	15	7-point grading scale	Internal examination	Oral exam based on a project
Renewable Energy Structures: Wind Turbines and Wave Energy Devices	Course	5	7-point grading scale	Internal examination	Written or oral exam
Wind Loads on Structures	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
3 SEMESTER Version B					
Academic Internship	Project	30	7-point grading scale	Internal examination	Oral exam based on a project
3 SEMESTER Version C					
Study at Other University		30			
4 SEMESTER					
Master's Thesis	Project	30	7-point grading scale	External examination	Master's thesis/final project
3-4 SEMESTER Version A					

Master's Thesis	Project	60	7-point grading scale	External examination	Master's thesis/final project
3-4 SEMESTER Version B					
Master's Thesis	Project	45	7-point grading scale	External examination	Master's thesis/final project
Renewable Energy Structures: Wind Turbines and Wave Energy Devices	Course	5	7-point grading scale	Internal examination	Written or oral exam
Wind Loads on Structures	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
3-4 SEMESTER Version C					
Master's Thesis	Project	45	7-point grading scale	External examination	Master's thesis/final project
Study at Other University [1]		15			

Students not familiar with Problem-based Learning at Aalborg University must attend the course "Problem-based Learning (PBL) and Project Management" as an integrated part of the project module on 1st, 2nd or 3rd semester, at the first semester studying at Aalborg University.

The study board must approve on the content of the ***Internship***, before it is commenced.

[1] The amount of ECTS followed at the other university must be 15 or 30 ECTS such that the size of the master's thesis is the remainder of the ECTS up to 60 ECTS for both the 3rd and the 4th semester.

If option ***Study at Other University*** is chosen on the 3rd semester - the study board must approve on the contents before the study is commenced. Assessment and exam according to the curriculum at the other university.

§ 19: ADDITIONAL INFORMATION

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 spelling and formulation 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 Board of Studies 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 must be in Danish.** The summary must be at least 1 page and not more than 2 pages. The summary is included in the evaluation of the project as a whole.

* Or another foreign language (upon approval from the Board of Studies).
** The Board of Studies can grant exemption from this.

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
In the individual case, the Board of Studies can approve successfully completed (passed) programme elements from other Master's programmes in lieu of programme elements in this programme (credit transfer). The Board of Studies 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 Board of Studies based on an academic assessment. See the Joint Programme Regulations for the rules on credit transfer.

Rules for examinations
The rules for examinations are stated in the Examination Policies and Procedures published by The Technical Faculty of IT and Design, The Faculty of Engineering and Science, and the Faculty of Medicine on their website.

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's website.

Exemption
In exceptional circumstances, the Board of Studies 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.

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.

§ 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 2017.

Students who wish to complete their studies under the previous curriculum from 2014 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.

The curriculum must be revised no later than 5 years after its entry into force.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

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