AALBORG UNIVERSITET

CURRICULUM FOR THE MASTER'S PROGRAMME IN STRUCTURAL DESIGN AND ANALYSIS, 2020

MASTER OF SCIENCE (MSC) IN ENGINEERING
ESBJERG

Link to this studyline

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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 Esbjerg.

§ 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 Built Environment

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme is associated with the external examiners corps on Nationwide engineering examiners/Building

§ 7: ADMISSION REQUIREMENTS

Admission to the Master's program in Structural Design & Analysis requires a Bachelor's degree in one of the programmes listed below.

Applicants with a legal right of admission (retskrav)

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

Applicants without legal right of admission

- Bachelor of Science in Engineering (Civil Engineering with specialisation in Structural and Civil Engineering), Aalborg University
- Bachelor of Science in Engineering (Mechanical Engineering and Manufacturing), Aalborg University
- Civil Engineering, Technical University of Denmark (DTU)
- Bachelor of Engineering (Civil and Structural Engineering), Aarhus University – School of Engineering
- Civil Engineering, University of Southern Denmark (SDU)

For further information on admission, see www.en.aau.dk.

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 programme entitles the graduate to the Danish designation Civilingeniør, cand.polyt. i design og analyse af konstruktioner. The English designation is: Master of Science (MSc) in Engineering (Structural Design and Analysis).

§ 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

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 scientifically based knowledge about the behavior of structures regarding the static as well as the dynamic response.
- Has an understanding of hydraulics as well as structure-soil and structure-fluid interaction based on scientific methods.
- Must understand analytical, numerical and experimental methods for analysis and design of structures including offshore related issues.
- Has knowledge about construction materials regarding their mechanical behavior and modeling.
- Has knowledge about loads, especially environmental loads like wind and wave loads, and methods for their evaluation.
- Has knowledge about risk and reliability in engineering including uncertainties of loads, geometry, material properties, structural response and computational models.
- Has knowledge in one or more subject areas that is based on the highest international research within the fields of structural and offshore engineering.

Skills:

- Excels in the scientific methods and tools as well as general skills related to employment within structural and offshore engineering.
- Can communicate research-based knowledge and discuss professional and scientific problems with peers as well as non-specialists, using the correct terminology in structural and offshore engineering.
- Can apply appropriate methods of analysis for investigating engineering structures and construction materials including offshore related issues.
- Can assess loads on structures, including environmental loading from wind and waves for offshore applications.
- Can assess the uncertainty connected with structural analysis, and judge the quality of the results.
- Can select and apply appropriate computational and experimental methods to investigate the static and dynamic response of structures including offshore related issues.
- Can apply experimental tests for obtaining material properties, calibrating computational models and assess uncertainties within the fields of structural engineering.

Competencies:

- Can select and apply appropriate methods for solving a given problem within structural engineering including specific issues in offshore applications and judge the results regarding their accuracy and validity.
- Can identify scientific problems within structural and offshore engineering and select and apply proper scientific theories, methods and tools for their solution.
- Can develop and advance new analyses and solutions within structural and offshore engineering.
- Can manage work-related situations that are complex and unpredictable, and which require new solutions.
- Can initiate and implement discipline-specific as well as interdisciplinary cooperation and assume professional responsibility.
- Can 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 that 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:

- project work
- lectures
- classroom instructions

- study groups
- workshop
- exercises
- laboratory tests
- measurements and testing in the field
- 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
- 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.

§ 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 ECTS are assessed by external examination.

Offered as: 1-professional Study programme: Structural Design & Analysis						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Structural Analysis of Load-Bearing Structures (B-DA-K1-2)	Project	10	7-point grading scale	Internal examination	Oral exam based on a project	English
Introduction to Problem Based Learning within Structural and Offshore Engineering (B-DA-K1-1)	Project	5	7-point grading scale	Internal examination	Oral exam based on a project	English

Structural Mechanics and Dynamics (B-DA-K1-3)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Modelling and Analysis of Offshore Structures (B-DA-K1-4)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Fluid and Water Wave Dynamics (B-DA-K1-5)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
2 SEMESTER						
The Excitation and Anchoring of Offshore Structures (B-DA-K2-1)	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Environmental Loads, Installation and Anchoring of Offshore Structures (B-DA-K2-2)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Risk and Reliability in Engineering (B-DA-K2-3)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Advanced Structural Analysis of Offshore Structures (B-DA-K2-4)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
3 SEMESTER Version A						
Analysis and Solution of Advanced Structural Offshore Problems (B-DA-K3-1)	Project	30	7-point grading scale	Internal examination	Oral exam based on a project	English
3 SEMESTER Version B [1]						
Project-oriented Study in an External Organisation (B-DA-K3-2)	Project	30	7-point grading scale	Internal examination	Oral exam based on a project	English
4 SEMESTER						
Master's Thesis (B-DA-K4-1)	Project	30	7-point grading scale	External examination	Oral exam based on a project	English

1 The study board must approve on the content of **the project-oriented study** before it is commenced.

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 can be selected freely within the field of structural and civil engineering.

On the 3rd semester students can choose to **study at another university**. The students must send an application to the Study Board before the study is commenced, where they apply for a preapproval of credit transfer of the contents of the modules at the other university.

§ 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 visit Moodle: https://www.moodle.aau.dk/course/view.php?id=9861

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of 1st of September 2020.

The Study Board does not offer teaching after the previous curriculum from 2021 after the summer examination/winter 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