AALBORG UNIVERSITET

CURRICULUM FOR THE MASTER OF SCIENCE (MSC) IN TECHNOLOGY (BUILDING ENERGY DESIGN), 2015

MASTER OF SCIENCE (MSC) IN TECHNOLOGY
AALBORG

Link to this studyline

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

Curriculum for the Master's Programme in Building Energy Design, 2018

TABLE OF CONTENTS

§ 1: PREFACE

Pursuant to Act 367 of March 23, 2013 on Universities (the University Act) with subsequent changes, the following curriculum for the Master's program in Building Energy Design is stipulated. The program also follows the Framework Provisions 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. 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). Further reference is made to Ministerial Order no. 111 of January 30, 2017 (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 program falls under The Faculty of Engineering and Science, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Master's program 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 Building Energy Design requires a

- Bachelor of Architectural Technology and Construction Management
- Bachelor of Technology Management and Marine Engineering
- Bachelor of Science in Civil Engineering; Structural and Civil Engineering
- Bachelor of Science in Civil Engineering; Indoor Environmental and Energy Engineering
- Bachelor of Science in Civil Engineering; Water and Environment
- Bachelor of Science in Civil Engineering; Transportation Engineering

Students with another Bachelor's degree, upon application to the Board of Studies, will be admitted after a specific academic assessment if the applicant is deemed to have comparable educational prerequisites. The University can stipulate requirements concerning conducting additional exams prior to the start of study.

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's program entitles the graduate to the designation Cand.tech. i bygningers energidesign. The English designation is: Master of Science (MSc) in Technology (Building Energy Design).

§ 9: PROGRAMME SPECIFICATIONS IN ECTS CREDITS

The Master's program is a 2-year, research-based, full-time study program. The program 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

It is assumed that the student can read academic texts in English and use reference works, etc.

§ 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 Building Energy Design and Operations that, in Building Energy Design, is based on the highest international research
- Can understand and, on a scientific basis, reflect on the Building Energy Design and Operation's knowledge and identify scientific problems
- Must have knowledge about basic architectural design methodology, the integrated design process and integrated building concepts

- Must understand the relationship between the thermal comfort, indoor air quality and health issues and the heat, moisture, mass and momentum transfer in buildings
- Be able to critically evaluate knowledge and identify new scientific problems within the field of Building Energy Design and Operations
- Must have knowledge about Life cycle cost analysis
- Must have knowledge about Environmental Assessment Methods and Tools

Skills

- Excels in Building Energy Design and Operation's scientific methods and tools and general skills related to employment within consulting engineering
- Can evaluate and select among the Building Energy Design and Operation's scientific theories, methods, tools and general skills and, on a scientific basis, advance new analyses and solutions
- Can communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists
- Must be able to apply both simple and advanced calculation methods for analysis and simulation of temperature conditions and heat flows in buildings and elements in HVAC systems under dynamic load conditions
- Must be able to apply, combine and evaluate advanced methods for analysis of the interplay between energy systems, architectural concepts, building design, building use, outdoor climate and HVAC systems
- Be able to apply a wide range of engineering methods in research and development in the field of Building Energy Design and Operations
- Must be able to measure the indoor environmental quality and energy consumption of a building and its systems
- Must be able to apply, combine and evaluate advanced methods for Life cycle cost analysis
- Must be able to apply, combine and evaluate advanced methods for Environmental Assessment Methods and Tools
- Must be able to design buildings using advanced methods at the highest international level

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
- Can optimise the operation of buildings based on measurement and analysis of the performance of the building
- Can combine, optimise and evaluate models for energy transport in buildings and HVAC systems
- Must be able to handle complex and research-oriented cases related to development of energy efficient buildings
- Be competent to solve new and complicated technical problems by the use of advanced scientific and technological knowledge
- Can design buildings using advanced methods at the highest international level

§ 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 started in the description of the modules in the Appendix.

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, 90-120 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 Thesis on the 4th semester can be selected freely within the field of Building Energy Design and Operations. The students have the choice of making a long master's thesis comprising both 3rd and 4 th semester.

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: Subject's for the Master's Program in Building Energy Design					
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method
1 SEMESTER					

Building Energy Use and Indoor Environmental Quality	Project	15	7-point grading scale	Internal examination	Oral exam based on a project
Introduction to PBL, Heat and Moisture Transport in Building	Course	5	7-point grading scale	Internal examination	Oral exam based on a project
Indoor Environmental Analysis and Measurements	Course	5	7-point grading scale	Internal examination	Oral exam based on a project
Building Energy Modelling	Course	5	7-point grading scale	Internal examination	Oral exam
2 SEMESTER					
Building Ventilation, Heating and Cooling	Project	15	7-point grading scale	External examination	Oral exam based on a project
Building Ventilation	Course	5	7-point grading scale	Internal examination	Oral exam based on a project
Building Heating and Cooling Systems	Course	5	7-point grading scale	Internal examination	Oral exam based on a project
Control and Analysis of Building Energy Systems	Course	5	7-point grading scale	Internal examination	Written or oral exam
3 SEMESTER Version A					
Building Commissioning Operation and Environmental Impact	Project	15	7-point grading scale	Internal examination	Oral exam based on a project
Environmental Assessment Methods and LCC Analysis	Course	5	7-point grading scale	Internal examination	Written or oral exam
Elective Course [1]	Course	5			
Elective Course [1]	Course	5			
3 SEMESTER Version B					
Study at Other University [2]		30			
4 SEMESTER					
Master's Thesis	Project	30	7-point grading scale	External examination	Master's thesis/final project
3-4 SEMESTER					
Master's Thesis	Project	45	7-point grading scale	External examination	Master's thesis/final project
Environmental Assessment Methods and LCC Analysis	Course	5	7-point grading scale	Internal examination	Written or oral exam
Elective Course [1]	Course	5			
Elective Course [1]	Course	5			

[1] 10 ECTS points of course modules on the 3rd semester are elective and the student must choose course credits from a list of approved courses by the Study board of Civil Engineering.

[2] 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 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 program at a university in Denmark or abroad
In the individual case, the Board of Studies can approve successfully completed (passed) program elements from other Master's programs in lieu of program elements in this program (credit transfer). The Board of Studies can also approve successfully completed (passed) program elements from another Danish program or a program outside of Denmark at the same level in lieu of program elements within this curriculum. Decisions on credit transfer are made by the Board of Studies based on an academic assessment. See the Framework Provisions for the rules on credit transfer.

Rules for examinations
The rules for examinations are stated in the Examination Policies and Procedures published by the Faculty of Engineering and Science on their 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 website of the School of Engineering and Science, including detailed information about the program, including exams.

Completion of the Master's program
The Master's program must be completed no later than four years after it was begun.

§ 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 1 February 2015.

In accordance with the Framework Provisions for the Faculty of Engineering and Science at Aalborg University, 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.