Curriculum for the Master’s Program in Architecture Cand.tech.

Aalborg University
September 2017
Preface

Pursuant to Act 261 of March 18, 2015 on Universities (the University Act) with subsequent changes, the following curriculum for the Master's program in Architecture is stipulated. The program also follows the Joint Program Regulations and the Examination Policies and Procedures for The Technical Faculty of IT and Design, The Faculty of Engineering and Science, and The Faculty of Medicine.
# Table of Contents

Chapter 1: Legal Basis of the Curriculum 3
   1.1 Basis in ministerial orders 3
   1.2 Faculty affiliation 3
   1.3 Board of Studies affiliation 3
   1.4 Body of External Examiners 3

Chapter 2: Admission, Degree Designation, Program Duration and Competence Profile 4
   2.1 Admission 4
   2.2 Degree designation in Danish and English 4
   2.3 The program’s specification in ECTS credits 4
   2.4 Competence profile on the diploma 4
   2.5 Competence profile of the program: 4

Chapter 3: Content and Organization of the Program 7
   3.1 Overview of the program 7
   3.2 Descriptions of modules 9

Chapter 4: Entry into Force, Interim Provisions and Revision 25

Chapter 5: Other Provisions 25
   5.1 Rules concerning written work, including the Master’s thesis 25
   5.2 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 25
   5.3 Rules for examinations 25
   5.4 Exemption 25
   5.5 Rules and requirements for the reading of texts 25
   5.6 Additional information 26

Enclosure 1: Evaluation formats 27
Chapter 1: Legal Basis of the Curriculum

1.1 Basis in ministerial orders
The Master’s program in Architecture 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 Programs at Universities (the Ministerial Order of the Study Programs) 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 13, 2015 (the Grading Scale Order) with subsequent changes.

1.2 Faculty affiliation
The Master’s program falls under the The Technical Faculty of IT and Design, Aalborg University.

1.3 Board of Studies affiliation
The Master’s program falls under the Board of Studies for Architecture and Design under School of Architecture, Design and Planning.

1.4 Body of External Examiners
The Master’s program falls under the Body of External Examiners for Engineers (Ingeniøruddannelsernes landsdækkende censorkorps (Design)).
Chapter 2: Admission, Degree Designation, Program Duration and Competence Profile

2.1 Admission
Applicants with a legal claim to admission (retskrav):
- Bachelor of Science (BSc) in Engineering (Architecture and Design), Aalborg University

Applicants without legal claim to admission:
Students with another Bachelor’s degree may, upon application to the Board of Studies, 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.

2.2 Degree designation in Danish and English
The Master’s program entitles the graduate to the designation cand. tech. (candidatus/candidate technologiae) i arkitektur / Master of Science (MSc) in Technology (Architecture)

2.3 The program’s specification 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.

2.4 Competence profile on the diploma
The following competence profile will appear on the diploma:

A graduate of the Master’s program has competencies acquired through an educational program that has taken place in a research environment.

The graduate of the Master’s program can perform highly qualified functions on the labor market on the basis of the educational program. Moreover, the graduate has prerequisites for research (a Ph.D. program). Compared to the Bachelor’s degree, the graduate of the Master’s program has developed her/his academic knowledge and independence, so that the graduate can independently apply scientific theory and method in both an academic and occupational/professional context.

2.5 Competence profile of the program:

The graduate of the Master's program:

Knowledge
- Must have a broad knowledge of theories, methods and practices associated with the professions of engineering, architecture and design combined with a knowledge of methods and practices associated with the professionalisms of engineering, architecture and design ranging from the design component to the building section to the city as a whole
- Must have advanced knowledge of analytical approaches to technical and societal aspects of the profession
- Must have a broad knowledge of both analogue and digital tools for the development and representation of architecture, design and urban design
- Must have extensive knowledge of the methods and theories of engineering related design applied to the styling of design components, building parts, buildings and entire building developments
- Must have an advanced knowledge of periods, theories, works
and principal figures in the history of architecture, urban and
genral design

- Must understand integrated architectural design where relevant
and strategically chosen technical parameters are fully
integrated with the architecture
- Must have scientifically based knowledge of key disciplines,
methodologies, theories and concepts within architectural
engineering
- Must have scientifically based knowledge in Tectonic and
Sustainable architectural design based on the highest
international research and references in these areas
- Must be able to reflect upon the relevant knowledge in
engineering and architectural theories, methods, and tools
related to Tectonic and Sustainable architectural design for
design of buildings with substantial engineering and architectural
qualities

Skills

- Must be able to demonstrate the ability to make advanced
integrated design* proposals at different scales
- Must be able to practically apply theories, methods and tools
within architecture, industrial design and urban design and to
apply skills associated with employment within the fields of
engineering and architecture on a scientific basis
- Must be able to assess theoretical and practical problems and to
select and motivate relevant solutions in architecture, design and
engineering on the basis of scientific methods
- Must be able to communicate disciplinary problems and
solutions to both peers and non-specialists as well as to
collaborators and users, and to analyse and understand the
connections between design, architecture, cities and society as a
whole
- Must able to apply advanced theories and methods in technical
fields of knowledge such as planning, construction, technique
and climatology
- Must master the scientific engineering and architectural theories,
methods and tools relevant to the design and development of
Tectonic and Sustainable architecture
- Must be able to use and communicate in the newest digital
calculation and simulation tools, 3D programming and CAD
programs
- Must be able to communicate research-based knowledge and
discuss professional and scientific problems with both peers and
non-specialists
- Must be able to select and apply appropriate engineering and
architectural methods, theories and tools competent in finding an
integrated design solution of Tectonic and Sustainable
architecture

* Integrated Design: Is a methodic process where research and
evidence based knowledge is continuously applied and integrated
through a succession of engineering, design and architectural based
theories and methods throughout the design process of the project.
Competencies

- Must be able to handle and manage complex and development-oriented situations in relation to both study and work
- Must be able with a professional approach independently and with demonstrable overview to participate in professional and interdisciplinary cooperation in the fields of engineering, architecture and design
- Must be able to identify own learning needs and structure own learning in various learning environments with a view to solving new types of problems
- Must possess high-level professional competencies in the intersection between the disciplines of engineering, architecture and design
- Must be able to independently make advanced integrated design proposals that fulfill all predefined criteria and target values regarding high engineering and architectural design quality on an international level
- Must be able to manage work-related situations that are complex and unpredictable, and which require new solutions in the built environment
- Must be able to independently initiate and implement interdisciplinary co-operation and assume professional responsibility
- Must be able to independently take responsibility for own professional development and specialization
Chapter 3: Content and Organization of the Program

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. Examinations 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:

- lectures
- classroom instruction
- project work
- workshops
- exercises (individually and in groups)
- teacher feedback
- reflection
- portfolio work

3.1 Overview of the program

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).

<table>
<thead>
<tr>
<th>Architecture 1st to 4th semester</th>
<th>Semester</th>
<th>P= Project module</th>
<th>C= Course modules</th>
<th>Module</th>
<th>ECTS</th>
<th>Assessment</th>
<th>Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>C</td>
<td>Zero Energy Buildings</td>
<td>5</td>
<td>7-point scale</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>C</td>
<td>Integrated Design of Sustainable and Tectonic Architecture</td>
<td>5</td>
<td>Pass/Fail</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>P</td>
<td>Sustainable Architecture</td>
<td>20</td>
<td>7-point scale</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td>2nd</td>
<td>Choose A or C</td>
<td>Performance-Aided Design: Form, Material, Structure, Acoustics and Fabrication</td>
<td>5</td>
<td>7-point scale</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>C</td>
<td>Tectonic Studies and Experimentations in Form, Structure, Materials and Details</td>
<td>5</td>
<td>Pass/Fail</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>P</td>
<td>Tectonic Design: Structure and Construction</td>
<td>20</td>
<td>7-point scale</td>
<td>External</td>
<td></td>
<td></td>
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<tr>
<td>B</td>
<td>C</td>
<td>Architecture, Health and Well-being</td>
<td>5</td>
<td>7-point scale</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>C</td>
<td>Materiality and Construction of Sustainable Buildings</td>
<td>5</td>
<td>Pass/Fail</td>
<td>Internal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Sustainable Welfare Buildings</td>
<td>20</td>
<td>7-point scale</td>
<td>External</td>
<td></td>
<td></td>
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<tr>
<td>3rd</td>
<td>Choose A or C</td>
<td>Construction Management</td>
<td>5</td>
<td>Pass/Fail</td>
<td>Internal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>C</td>
<td>Transfer of Knowledge from Architectural Engineering to Practice</td>
<td>5</td>
<td>Pass/Fail</td>
<td>Internal</td>
<td></td>
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<tr>
<td></td>
<td>P</td>
<td>Research and Development in Architectural Engineering and Design</td>
<td>20</td>
<td>7-point scale</td>
<td>Internal</td>
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<tr>
<td>B</td>
<td>C</td>
<td>Construction Management</td>
<td>5</td>
<td>Pass/Fail</td>
<td>Internal</td>
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<td></td>
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<tr>
<td>Semester</td>
<td>P= Project module</td>
<td>C= Course modules</td>
<td>Module</td>
<td>ECTS</td>
<td>Assessment</td>
<td>Exam</td>
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<tr>
<td>or</td>
<td>P</td>
<td></td>
<td>Academic Internship</td>
<td>25</td>
<td>7-point scale</td>
<td>Internal</td>
<td></td>
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<tr>
<td>or</td>
<td>C/C</td>
<td></td>
<td>Study at another university</td>
<td>30</td>
<td>Transfer of credits</td>
<td>Transfer of credits</td>
<td></td>
</tr>
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<td>D</td>
<td>P</td>
<td></td>
<td>Long Master’s Thesis*</td>
<td>+30</td>
<td>7-point scale</td>
<td>External</td>
<td></td>
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<tr>
<td>4th</td>
<td>P</td>
<td></td>
<td>Master’s Thesis</td>
<td>30, possible 60</td>
<td>7-point scale</td>
<td>External</td>
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<td>Total 120 ECTS</td>
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Minimum 100 ECTS are evaluated by 7-point scale, and minimum 50 ECTS are evaluated with an external examiner.

* See module description for the Master’s thesis. The Long Master’s thesis is prepared in the 3rd and 4th semesters; the extent is 60 ECTS.
3.2 Descriptions of modules

1st semester

Title: Zero Energy Buildings (5 ECTS)
Energineutralt byggeri

Objective: The aim of the course is to enable students in a professional way to develop and document Zero Energy Buildings using both passive and active energy technologies.

Students who complete the module:

Knowledge
- Must have knowledge of the political strategy at national as well as international level for saving energy in the building sector
- Must have knowledge of energy optimisation of existing buildings
- Must have knowledge of intelligent and dynamic climate shields
- Must have knowledge of active energy technologies

Skills
- Must be able to apply indoor environmental systems and technologies
- Must be able to analyse, simulate and apply passive energy technologies in buildings
- Must be able to simulate and analyse the dynamic behavior of a building regarding indoor environment and energy use taking all relevant parameters into account
- Must be able to apply advanced mathematical models to the analysis of passive energy technologies and the interplay between building design, building use and outdoor climate

Competencies
- Can discuss and reflect on the influence of the chosen indoor environmental level on the buildings total energy use
- Can use a professional and interdisciplinary approach to the design of zero energy building
- Can use a professional and interdisciplinary approach to energy optimisation of existing buildings
- Can choose proper modeling of single zone and multi-zone buildings and discuss inherent model limitations

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Integrated Design of Sustainable and Tectonic Architecture (5 ECTS)

Objective: The aim of the course is to enable the students to acquire knowledge of technical, functional and aesthetic aspects of and approaches to sustainable architecture, to acquire knowledge of integrated design concepts and to become skilled in analysing and comparing such approaches and concepts with regard to user needs.

Students who complete the module:

Knowledge
- Must have knowledge of different approaches to sustainable architecture
- Must have knowledge of different low-energy and zero-energy concepts and the importance of user-related behavior
- Must have knowledge of sustainable site planning and infrastructure
- Must have knowledge about architecture in relation to site, climate and materials

Skills
- Must be able to use the terminology in the field of sustainable architecture
- Must be able to analyse and reflect upon the integration of climatic, technical, spatial, social, functional, aesthetic and logistic needs of a specific client and/or user group
- Must be able to analyse and evaluate different strategies to design sustainable architecture and zero-energy buildings
- Must be able to evaluate buildings by using assessment and certification methods for high performance buildings

Competencies
- Can evaluate different approaches to zero-energy concepts
- Can analyse a building concept with regard to architectural qualities and the technical performance of the building and users needs
- Can evaluate different concepts with regard to their qualities in relation to the people who live or work in the buildings
- Can evaluate methodologies of building certification methods

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam Format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Objective: The aim of this project is to develop preliminary building design for a zero-energy building using advanced integrated design process methodology. Technical, spatial, social, functional, logistical as well as aesthetic problems must be solved in the integrated building design.

Students who complete the module:

Knowledge
- Must have knowledge of advanced integrated design
- Must have knowledge of different strategies in the field of sustainable architecture
- Must have knowledge of passive energy technologies in relation to indoor environment
- Must be knowledgeable about the fundamental principles of Problem Based Learning (PBL) as implemented in the Aalborg PBL model at the Faculty of Engineering and Science (*)

Skills
- Must be able to elaborate the building design through the advanced use of the integrated design process
- Must be able to integrate technical solutions in relation to energy and climate with respect to the performance of the building
- Must be able to evaluate the technical solutions for the building
- Must be able to choose, implement and combine strategies for the use of passive as well as active energy technologies
- Must be able to model and design zero-energy buildings with sustainable architectural qualities
- Must be able to devise solutions which include social, technical and environmental aspects
- Must be able to identify and target their design to the defined user group and their demands and well-being in the building
- Must be able to structure project management activities based on a wellformulated problem formulation (*)

Competencies
- Can develop an integrated building proposal that fulfills all predefined architectural, functional and technical design criteria and target values
- Can communicate proper terminology in oral, written and graphical communication and documentation of problems and solutions in the integrated design of buildings and building services
- Can discuss and reflect on potentials and limitations in integrated building energy design
- Must be able to reflect on, plan and manage a study project in a PBL learning environment (*)

(*) To obtain the knowledge, skills and competence marked with (*) it is presupposed that students...
follow the course in Problem Based Learning and Project Management that the school offers all foreign students in the beginning of 1st semester.

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version P.

Evaluation criteria: Are stated in the Joint Program Regulations.
Elective A

Title: Performance-Aided Design: Form, Material, Structure, Acoustics and Fabrication (5 ECTS)

Performancebaseret design: Form, materiale, struktur, akustik og fabrikation

Prerequisites: The module adds to knowledge obtained in 1. semester of the Master’s program in Architecture

Objective: The aim of the course is to enable students with the parametric design tools and the understanding required to develop integrated design with respect to form, material, structure and fabrication. Parametric design tools support the definition of advanced geometry, and the interaction between geometry and structural and/or acoustics analysis. Issues of fabrication are considered in the context of parametric modeling and rapid prototyping.

Students who complete the module:

Knowledge
• Must have knowledge of complex spatial structures, including an understanding of the structural functionality of various construction systems using shells, plates, frames, beams, etc.
• Must have knowledge of parametric design tools that enable the generation of quick feedback loops from generation of form and performance analysis (structure, acoustics)
• Must have knowledge of advanced room acoustics

Skills
• Must be able to use parametric design tools to enable quick feedback loops between geometric exploration of form and performance analysis including structural and acoustic parameters
• Must be able to make a structural analysis of complex spatial structural systems
• Must be able to use advanced numerical tools for structural and acoustics analysis of advanced structural systems or rooms

Competencies
• Can create a synthesis of architectural, structural and acoustic requirements larger scale buildings, by using parametric design tools that support the definition and control of advanced geometry, digital fabrication and performance analysis

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Tectonic Studies and Experimentations in Form, Structure, Materials and Details (5 ECTS)

Tektoniske studier og eksperimenter med form, struktur, materialer og detaljer.

Prerequisites: The module adds to knowledge obtained in 1. semester of the Master’s program in Architecture

Objective: The aim of the course is to provide a broad critical understanding of tectonic theory and practice in tectonic design through the presentation and analysis of relevant engineering and architectural theories, methods and models in historical as well as contemporary engineering and architectural design combined with physical tectonic studies, experimentation, modeling, prototyping and crafting.

Students who complete the module:

Knowledge
- Must have knowledge of tectonic theory, methods and models that are applicable to a tectonic design
- Must have knowledge of prototyping and crafting methods
- Must have tectonic knowledge of interrelationship between form, structure, materials and detail

Skills
- Must be able to analyse and critically reflect on the application and use of form, structure, materials and details in a tectonic design
- Must be able to design and model tectonic constructions with an interrelationship between form, structure, materials and detail
- Must be able to demonstrate understanding of tectonic constructions during experimentation, modeling, prototyping and crafting

Competencies
- Can design a tectonic project on the basis of engineering and architectural analyses, sketches, physical models and a critical account of the process evaluating its tectonic quality

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Tectonic Design: Structure and Construction (20 ECTS)
Tektonisk design: Struktur og konstruktion

Prerequisites: 1. Master semester in Architecture

Objective: The aim of the project is to develop a preliminary design with a tectonic design approach and to achieve an authenticity of innovative design of structure and the architectural expression by ensuring a continuity and integrity between form, structure and construction. Further the aim is to develop the Nordic craft tradition in relation to the new innovative design of structure, use of materials and means of construction in contemporary architecture.

Students who complete the module:

Knowledge
- Must have knowledge of complex spatial structures, including an understanding of the structural functionality of various construction systems in connection with the architectural ideas behind a project and in relation to context
- Must have knowledge of tectonic theory and methods and a critical understanding of Nordic architecture, and an aesthetic and technical understanding of the interplay between form, structure, materials and detail in relation to the integrity of architectural design

Skills
- Must be able to make engineering and architectural innovative design of buildings that emphasize the interplay between form, structure, materials and detail in relation to the integrity of an architectural idea
- Must be able to do performance aided design using parametric design tools for structural and acoustical analysis
- Must be able to synthesize complex room programs, functional and aesthetic demands, and be able to integrate constructional and tectonic design in a coherent architecutonic project solution of substantial quality
- Must be able to apply critical reasoning to the innovative engineering and architectural design issues that arise through project development and to demonstrate independent thinking and informed judgment

Competencies
- Can demonstrate making performance aided engineering and architectural design of a building of high complexity and substantial scale
- Can prepare a design proposal for a tectonic building of substantial aesthetic, architectural, constructive, structural and functional qualities
- Can present the project in a professionally competent way by means of relevant media and techniques

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version C.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Architecture, Health and Well-being (5 ECTS)

Prerequisites: The module adds to knowledge obtained in 1. semester of the Master's program in Architecture

Objective: To address some of the most important societal challenges such as aging society, lifestyle diseases and stress, the course focuses on social sustainability within building types that address these topics like elderly homes, schools, kindergartens and psychological institutions. The main goal is to gain knowledge, skills and competencies in the sustainable design of buildings for health and well-being.

Students who complete the module:

Knowledge:
- Must have knowledge of social sustainability in built environments
- Must have knowledge of state-of-the-art design principles for health and well-being
- Must have knowledge of human behavior related to indoor environment, light and built structures
- Must have knowledge of theories and methods to address human physical, social and psychological needs and demands for architecture

Skills:
- Must be able to apply evidence based research on indoor climate, light and structural principles to support health and well-being in the design of built environments
- Must be able to understand human perceptions of the architectural environment and address this in the design of health and welfare buildings
- Must be able to critically address user perspectives and integrate concerns for human behavior, needs and demands in the design of health and welfare buildings

Competencies:
- Must be able to use research and evidence-based knowledge in discussion and reflection on building designs for health and well-being
- Must be able to evaluate architectural strategies for health and well-being
- Must be able to critically evaluate and discuss the impact of indoor environment, light and structural design on health and well-being

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Materiality and Construction of Sustainable Buildings (5 ECTS)

Materialitet og konstruktion af bæredygtige bygninger

Prerequisites: 1 The module adds to knowledge obtained in 1. semester of the Master’s program in Architecture

Objective: The aim of the course is to provide an understanding of the diverse and specific qualities of building materials and constructions and their use in contemporary buildings. The course aims at providing an advanced understanding of material theory, experimental methods of working with materials and practice in design and evaluation of sustainable buildings. This includes insight into material behavior of selected materials, certification systems as well as appreciation of how materials may be applied and perceived within the architectural realm.

Students who complete the module:

Knowledge

- Must have knowledge of state-of-the-art materials and building products related to sustainable building design
- Must have knowledge of green building certification systems, including principles for life cycle assessment and life cycle costs of materials
- Must have advanced knowledge of perception of materials in architecture in relation to thermal, visual, tactile, acoustic and aging qualities and durability.

Skills

- Must be able to carry out assessment and certification of buildings with regard to materials and construction
- Must be able to master building detailing of sustainable architecture as regards to technical performance and materiality
- Must be able to address developments in building materials and components as regards to technical properties, technology and impact on human perception

Competencies

- Must be able to independently discuss and reflect upon the complex use of materials in sustainable buildings
- Must be able to independently discuss and reflect upon green building evaluation methods
- Must be able to demonstrate a professional and interdisciplinary approach to the selection and application of materials in sustainable building

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Sustainable Welfare Buildings (20 ECTS)

Bæredygtigt velfærdsbyggeri

Objective: The aim of the project is to enable the students to develop preliminary building design for energy efficient welfare buildings with special emphasis on structure, materials and detailing aspects of architecture and using an advanced integrated design approach. Technical, structural, spatial, social, health, well-being, functional, logistical as well as tectonic and aesthetic problems must be solved in an integrated building design for a specific user group.

Students who complete the module:

Knowledge
- Must have knowledge of advanced integrated design
- Must have knowledge of material and structural methods, principles and strategies that are applicable to sustainable architecture
- Must have knowledge of architectural conditions for health and well-being
- Must have knowledge of different strategies in the field of sustainable welfare architecture

Skills
- Must be able to choose, implement and combine structural strategies with passive as well as active energy strategies in architectural design
- Must be able to choose and implement building materials with adequate detailing
- Must be able to model and design energy efficient buildings with sustainable structural qualities using computational design tools
- Must be able to identify and target a design for a defined user group and defined activity with emphasis on indoor climate and sensuous qualities
- Must be able to evaluate the sustainable standard of the building according to acknowledged environmental certification systems.

Competencies
- Must be able to develop a sustainable welfare building proposal that fulfills all predefined architectural, structural, functional, social, energy and acoustic requirements
- Must be able to communicate proper terminology in oral, written and graphical communication and documentation of problems and solutions in the integrated design of buildings and building services
- Must be able to discuss and reflect on tectonic, material, perceptive and aesthetic qualities of integrated sustainable building design

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3

Exam format: Version C.

Evaluation criteria: Are stated in the Joint Program Regulations.
3rd semester

Title: Construction Management (5 ECTS)  
*Projekt-, design- og byggeledelse*

Prerequisites: The student must have knowledge, skills and competencies within the architectural design and engineering field corresponding to the completion of the MSc01 and MSc02 Architectural Engineering education.

Objective: An introduction to project, design and construction management.

Students who complete the module:

Knowledge:
- Must have knowledge and understanding of theories and methods within project, design or construction management
- Must have knowledge of ethical, economical, legal and social interests in the field of construction management
- Must have knowledge of current theories and practice in construction management

Skills:
- Must be able to analyse and assess the cross-disciplinary inclusion of actors involved in the decision-making processes
- Must be able to use methods and techniques for preparing cost estimates for building construction projects
- Must be able to apply methods of planning and scheduling of construction projects
- Must be able to identifying work elements, estimating activity durations, preparing network schedules and schedule updates, analysing planned vs. actual project progress

Competencies:
- Can apply methods and theories for project, design or construction management within a given budget using specified materials and construction methods

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Transfer of Knowledge from Architectural Engineering to Practice (5 ECTS)

Overførsel af forskning fra bygningsingeniørområdet til praksis

Prerequisites: The student must have knowledge, skills and competencies within the architectural design and engineering field corresponding to the completion of the MSc01 and MSc02 Architectural Engineering education.

Objective: To familiarise students with basic research methods and theories within the field of architectural engineering and enable them to acquire specific knowledge in relation to architectural engineering research.

Students who complete the module:

Knowledge:
- Must have scientifically based knowledge of key disciplines, methodologies, theories and concepts within architectural engineering
- Must be able to reflect on the validity and relevance of the data and results produced through various methodologies

Skills:
- Must be able to approach scientific methods and theories within architectural engineering related research
- Must be able to formulate a given scientific problem in clear and consistent way
- Must be able to evaluate the results, relevance and quality of the chosen architectural engineering research issue
- Must be able to communicate relevant aspects of scientific and professional knowledge in a clear and systematic way

Competencies:
- Can choose relevant methods and analyse the findings of the research relevant for the task and apply the results of architectural engineering research
- Can communicate and transfer the results of architectural engineering research for practical use

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version L.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Research and Development in Architectural Engineering and Design (20 ECTS)

Forskning og udvikling inden for bygningsingeniør- og designområdet

Prerequisites: The student must have knowledge, skills and competencies within the architectural design and engineering field corresponding to the completion of the MSc01 and MSc02 Architectural Engineering education.

Objective: The aim of the project is to use the latest architectural engineering research to raise the knowledge level and to qualify the knowledge in the project. Furthermore, the project must document the use of architectural engineering research based knowledge.

Students who complete the module:

Knowledge
- Must have knowledge of practice within the chosen field related to architectural engineering
- Must have knowledge of the theory used or the methodologies within the chosen field

Skills
- Must have the ability to select architectural engineering research based knowledge in the chosen field
- Must be able to select an appropriate research method for the chosen problem area to be examined within the given timeframe or time available
- Must be able to apply relevant research methods as well as praxis-oriented methods

Competencies
- Must be able to seek out current research for a theoretical or concrete research project of their choice
- Must be able to integrate relevant research knowledge into a practical project or a theoretical project related to architectural engineering
- Must be able to communicate research results

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version P.

Evaluation criteria: Are stated in the Joint Program Regulations.
Title: Academic Internship (25 ECTS)

Projektorienteret forløb

Prerequisites: The student must have knowledge, skills and competencies within the architectural design and engineering field corresponding to the completion of the MSc01 and MSc02 Architectural Engineering education.

Objective: Is to give the students an opportunity to use skills they have acquired during the 1st and 2nd master semesters.

Students who complete the module:

Knowledge:
• Must have practical, conceptual and professional knowledge of relevance to architectural / engineering design practice

Skills:
• Must be able to engage with a professional environment in relation to architectural engineering design assignments
• Must further develop and challenge their interdisciplinary approach skills
• Must be able to reflect upon construction management in praxis

Competencies:
• Can participate in cross-disciplinary team-works and solving architectural / engineering design related tasks e.g. in a relevant architectural and/or engineering company or consultancy, the state, the authorities, the local authorities

Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version P.

Evaluation criteria: Are stated in the Joint Program Regulations.
4\textsuperscript{th} semester

Title: Master's Thesis (30 ECTS) 
\textit{Kandidatspeciale}

The master thesis can be conducted as a long master thesis. If choosing to do a long master thesis, it has to include experimental work and has to be approved by the study board. The amount of experimental work must reflect the allotted ECTS.

Prerequisites
The student must have knowledge, skills and competencies within the architectural design and engineering field corresponding to the completion of the MSc01 - MSc03 Architectural Engineering education.

Objective: The final semester sets the stage of manifestation of the students' abilities to make design solutions. The students must define a problem and display the ability to achieve a design proposal in an integrated whole. The work must include relevant theories and methodologies and be based on the skills and competencies acquired throughout the Master's program in architecture.

Students who complete the module:

Knowledge
- Must demonstrate knowledge and understanding within the field of specialisation at a high international level
- Must be able to critically assess knowledge and identify problems within the field of specialisation
- Must demonstrate the ability to select appropriate research based knowledge in the process

Skills
- Must be able to use an advanced integrated design process
- Must be able to independently motivate their choice of methods or/and theoretical approach
- Must be able to demonstrate the acquired skills in tectonics and sustainability in accordance with and at a level suitable to the chosen theme of the master thesis
- Must be able to apply a range of methods within the field of engineering and architecture and demonstrate the use of selected parameters in engineering within the field of specialisation
- Must be able to communicate in a clear and systematic way relevant scientific and professional aspects of the project work both to peer and non-peer

Competencies
- Can independently develop a project based on a specific problem within the field of specialisation to the highest international standards
- Can be competent in finding an integrated design solution of Tectonic and Sustainable architecture and make a design that fulfill all predefined criteria
- Can anticipate and solve problems and make a synthesis in the design that includes the technical, functional and aesthetic qualities
- Must be able to present the results of the project work professionally
Type of instruction: See general description of the types of instruction described in the introduction to Chapter 3.

Exam format: Version C.

Evaluation criteria: Are stated in the Joint Program Regulations.
Chapter 4: Entry into Force, Interim Provisions and Revision

The curriculum is approved by the Dean of The Technical Faculty of IT and Design and enters into force as of September 2017.

Students who wish to complete their studies under the previous curriculum from 2015 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.

Chapter 5: Other Provisions

5.1 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.

5.2 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 Joint Program Regulations for the rules on credit transfer.

5.3 Rules for examinations

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

5.4 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.

5.5 Rules and requirements for the reading of texts

At programs 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

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2 Or another foreign language (upon approval from the Board of Studies).
3 The Board of Studies can grant exemption from this.
European languages. At programs taught in English, it is assumed that the student can read academic text and use reference works, etc., in English.

5.6 Additional information
The current version of the curriculum is published on the Board of Studies' website, including more detailed information about the program, including exams.
Enclosure 1: Evaluation formats

Evaluation formats for the Bachelor and Master programs under the Board of Studies for Architecture and Design, School of Architecture, Design and Planning.

Please refer to the study guide of the relevant semester and module for further descriptions of the chosen evaluation format.

Project modules

Evaluation format C – Project module with external examination:
The module is assessed by an oral assessment based on written material, typically a jointly prepared (or in exceptional cases, prepared by the individual student) project module report (containing the report/analyzes/posters/drawings/models) where the individual examinee’s contribution is not indicated. It is further presumed that the student has regularly and actively participated in evaluation seminars etc..

The module is assessed with external examination.

The written material is submitted in physical form to the semester secretary and also digitally uploaded to the directory assigned by the semester secretary. This according to the current delivery requirements in the Semester Description or Study Guide.

Evaluation format P – Project module with internal examination:
The module is assessed by an oral assessment based on written material, typically a jointly prepared (or in exceptional cases, prepared by the individual student) project module report (containing the report/analyzes/posters/drawings/models) where the individual examinee’s contribution is not indicated. It is further presumed that the student has regularly and actively participated in evaluation seminars etc..

The module is assessed with internal examination.

The written material is submitted in physical form to the semester secretary and also digitally uploaded to the directory assigned by the semester secretary. This according to the current delivery requirements in the Semester Description or Study Guide.

Course modules:

Evaluation format L – Course module, oral or written assessment.
Comprising of:

Evaluation format La – Course module, oral assessment:
The module is assessed with an oral assessment based on written material prepared by the individual student such as a portfolio presentation or a (possibly jointly prepared) project module report (containing the report/analyzes/posters/drawings/models). It is further presumed that the student has regularly and actively participated in evaluation seminars.

Oral assessment with aid and without preparation time.

The written material must be digitally uploaded to the directory assigned by the semester secretary. This according to the current delivery requirements in the Semester Description or Study Guide.
**Evaluation format Lb** – Course module, oral assessment:
The module is assessed with an oral exam based on the objectives for the course module. The examinee pulls a known and predefined question, after which the assessment begins.

Oral assessment without aid and without preparation time

**Evaluation format Lc** – Course module, oral assessment:
The module is assessed with an oral exam based on the objectives for the course module. The examinee pulls a question, gets preparation time, after which the assessment begins.

Oral assessment without aid and with preparation time – aid is allowed in the preparation time.

**Evaluation format Ld** – Course module, written assessment:

The module is assessed with a written assignment based on central parts of the objectives for the course module through one or more written assignments (including reports/analyses/posters/drawings/models or the like).

A written assignment is developed during the execution of the course module.

The written material must be digitally uploaded to the directory assigned by the semester secretary. This according to the current delivery requirements in the Semester Description or Study Guide.

**Evaluation format Le** – Course module, written assessment:

The module is assessed with a written assignment based on central parts of the objectives for the course module.

A written assignment given by the end of the course module and completed within a defined time frame.

The written material must be digitally uploaded to the directory assigned by the semester secretary. This according to the current delivery requirements in the Semester Description or Study Guide.

**Evaluation format V** – Course module:
The module is passed by the student’s regular and active participation in teaching/evaluation seminars or the like and by compliance with the assignment requirements of the course module.

The module is assessed by internal assessment.