

CURRICULUM
for
the Architectural Technology and Construction
Management Programme
Effective from 1 January 2019

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Please note: This is a translation of the Danish curriculum for the Architectural Technology and Construction Management programme and intended for information purposes only. In the event of any discrepancy between this translation and the Danish original, the Danish text shall prevail

This national part of the curriculum for the Architectural Technology and Construction Management programme (Bachelor of Architectural Technology and Construction Management) has been released in accordance with section 18(1) of the Ministerial Order for technical and commercial Academy Profession Programmes and Professional Bachelor Programmes. This curriculum is supplemented with an institutional part of the curriculum, provided by the individual institution offering the programme.

After it has been approved by either the Board of Directors (or the Rectors) and after consultation with the institutions' Educational Committees and the External Examiners' chairmanship for the specific programme, the educational network for the Architectural Technology and Construction Management programme (Bachelor of Architectural Technology and Construction Management) and Academy Profession Programmes in Construction Technology (AP Graduate in Construction Technology) prepares the institutional part.

1. The programme's goals for learning outcomes

Knowledge

The graduate has

- 1) development-based knowledge and understanding of the principles, theories and methods applied by the profession within management, design, planning and performance of complex building and construction projects and is able to reflect on the application of these theories and methods in different situations;
- 2) development-based knowledge about scientific-theoretical concepts and methods relevant for the profession, as well as about communication theories and methods to communicate building-technical problems, including through use of digital media within building-technical areas and within general areas;
- 3) development-based knowledge about the principles and models applied by the industry for establishing, operating and organising a business, and about societal and technological factors and conditions that influence the building process, including problems within the areas of energy, working environment and sustainability, in a local as well as a global perspective; and
- 4) knowledge about managerial, social, linguistic, cultural and ethical aspects related to planning and cooperating on building projects.

Skills

The graduate can

- 1) assess and apply methods relevant for the profession, including relevant digital programmes and systems, with regard to managing, designing, planning and executing complex building and construction projects;
- 2) choose a relevant method and substantiate the choice within the context of the profession;
- 3) assess, combine and consider relevant research knowledge in solving complex building-technical problems;
- 4) communicate practice-based and specialist knowledge about building-technical research and development to relevant players using relevant media;
- 5) assess business-related and organisational problems; and
- 6) assess and understand societal and technological factors and conditions in connection with the organisation of building activities, including aspects related to energy, working environment and sustainability.

Competences

The graduate can

- 1) work independently on technical and cross-disciplinary projects and assume responsibility within the framework of a professional code of conduct;
- 2) manage, design, plan and carry out complex building and construction projects independently and in cooperation with other professionals;
- 3) identify own knowledge and learning requirements, acquire new knowledge and translate this into professional practice;

- 4) manage the communication between users, clients, consultants and contractors (design and execution phases) about technical planning, tendering and execution of complex building and/or construction projects;
- 5) manage administrative tasks and project management tasks within the area of building and construction;
- 6) deal with societal and technological aspects in the design and development of building projects; and the student has competences to
- 7) deal with social, cultural and ethical aspects at play in the design and development of building projects, as well as to work in managerial and cooperation contexts with other professionals from different educational, cultural and language backgrounds.

2. The programme includes five national subject elements

2.1 Residential construction (1st semester)

Contents

The national subject element consists of a cross-disciplinary project in the form of a specific, small residential construction project.

The subject element comprises 30 ECTS credits and includes the following subject areas:

Communication and cooperation (10 ECTS credits)

Production (5 ECTS credits)

Design-phase planning (15 ECTS credits)

Learning objectives for Residential construction

Knowledge

In relation to the national subject element *Residential construction*, the student should have acquired development-based knowledge about

- 1) the relationship between different technical/professional problems and should be able to understand industry practice;
- 2) relevant communication theories and methods, including digital media, for communicating building-technical problems;
- 3) tools and standards for documentation and communication;
- 4) the basic professional and technical disciplines of the profession and the associated relevant documentation;
- 5) basic working methods and insight into methods of execution for use in planning, cooperation and learning;
- 6) common, applied mathematical and structural principles of significance for the profession;
- 7) fundamental statics, energy and installations;
- 8) industry players, professional areas and insight into the building process;
- 9) principles and tools applied in project management for building and construction activities;
- 10) principles and tools applied in land surveying, staking and registration in the building and construction area.

Skills

In relation to the national subject element *Residential construction*, the student should be able to

- 1) apply methods and tools to collect, analyse and process information;
- 2) apply instruments for land surveying and staking, appraise tolerances and, by means of this, choose relevant solution models;
- 3) apply relevant communication theories and methods to communicate practice-based problems and solutions;
- 4) apply development-based design and production methods;
- 5) set up and choose methods in the organisation of building processes;
- 6) at basic level, structure own work and the work of relevant working groups;
- 7) apply methods and tools in land surveying and staking tasks;

Competences

In relation to the national subject element *Residential construction*, the student should have acquired the competences to

- 1) acquire knowledge, skills and competences in a structured and cohesive manner;
- 2) manage practice-based, technical and administrative tasks;
- 3) address the relationship between different technical/professional problems;
- 4) participate in professional and cross-disciplinary cooperation.

ECTS weight

The subject element *Residential construction* is worth 30 ECTS credits.

2.2 Low-rise construction not exceeding 2½ floors (2nd semester)

This subject element consists of a cross-disciplinary project in the form of a specific construction project not exceeding 2½ floors.

The subject element comprises 30 ECTS credits and includes the following subject areas:

Business (5 ECTS)

Communication and cooperation (5 ECTS credits)

Production (10 ECTS credits)

Design-phase planning (10 ECTS credits)

Learning objectives for Low-rise construction not exceeding 2½ floors:

Knowledge

In relation to the national subject element *Low-rise construction not exceeding 2½ floors*, the student should have acquired development-based knowledge about

- 1) the relationship between different technical/professional problems, and the student should be able to understand the industry practice;
- 2) relevant communication theories and methods, including digital media, for communicating building-technical problems;
- 3) tools and standards for documentation and communication;
- 4) the basic professional and technical disciplines of the profession and the associated relevant documentation;
- 5) basic working methods and insight into methods of execution for use in planning, cooperation and learning;
- 6) relevant environmental, financial, technological and social aspects in the production process;
- 7) current principles, methods and regulation within business and entrepreneurship;
- 8) basic legal rules and contractual matters;
- 9) production concepts and methods applied in practice;
- 10) the construction of digital building information models (BIMs) with relevant information for design-phase planning;
- 11) principles, theories, methods and tools applied in financial management;
- 12) specific production tools applied in industry practice.

Skills

In relation to the national subject element *Building up to 2½ floors*, the student should be able to

- 1) apply methods and tools to collect, analyse and process information;
- 2) communicate practice-based problems and solutions to cooperation partners and users;
- 3) assess theoretical and practice-based problems pertaining to design-phase planning, as well as substantiate actions and solutions;
- 4) apply design-planning and production-technical methods;
- 5) set up and choose tools for use in financial management;
- 6) assess project and production material in connection with quality assurance procedures.

Competences

In relation to the national subject element *Building up to 2½ floors*, the student should have acquired the competences to

- 1) acquire knowledge, skills and competences in a structured and cohesive manner;
- 2) participate in professional and cross-disciplinary cooperation with a professional approach;
- 3) address the relationship between different technical/professional problems;
- 4) manage development-based design-phase planning and account for the principles in the execution phase;
- 5) manage relevant tendering, contractual and organisational forms.

ECTS weight

The subject element *Low-rise construction not exceeding 2½ floors* is worth 30 ECTS credits.

2.3 Industry and prefabrication (3rd semester)

This subject element consists of a cross-disciplinary project on the design-phase planning of industrialised components used in a specific construction project.

The subject element comprises 25 ECTS credits and includes the following subject areas:

Business (5 ECTS)

Communication and cooperation (5 ECTS credits)

Production (10 ECTS credits)

Design-phase planning (5 ECTS)

Learning objectives for Industry and prefabrication

Knowledge

In relation to the national subject element *Industry and prefabrication*, the student should have acquired development-based knowledge about

- 1) the relationship between different technical/professional problems, and the student should be able to understand the industry practice;
- 2) relevant communication theories and methods, including digital media, for communicating building-technical problems;
- 3) tools and standards for documentation and communication;
- 4) industrial production and execution methods in the industry;
- 5) industrial structural designs, planning and management tools, and should have understanding of technical installations and statics principles;
- 6) calculation methods within mathematics and physics applied by the industry;
- 7) basic principles, theories and methods within business finance and human resource management, and the student should understand industry practice;
- 8) the nature of legal rules and legal reasoning;
- 9) basic rules of property law, i.e. contract law and law of damages, in relation to relevant practice;
- 10) industry possibilities and regulations concerning starting your own businesses;
- 11) corporate and other forms of business organisation in relation to establishing and operating a business, and the student should be able to understand strategies and business plans to substantiate choices in this area;
- 12) social, cultural and ethical aspects which influence the establishment, operation and administration of a business;
- 13) principles, theories and methods applied in project management of building and construction activities in a business or at a building site;
- 14) digital systems and methods for optimisation of the information flow in building and construction projects.

Skills

In relation to the national subject element *Industry and prefabrication*, the student should be able to

- 1) apply methods and tools to collect, analyse and process information;
- 2) communicate practice-based problems and solutions to cooperation partners and users;

- 3) apply design-planning and production-technical methods;
- 4) set up and choose methods and tools for use in organisation, management, project management, administration and operation in a business;
- 5) apply relevant building and construction law as well as legal rules in relation to business operation and administration;
- 6) apply accounting principles in business operation and set up and choose methods and tools for budgeting, accounting and tendering in the industry;
- 7) apply industry methods, forms and standard contracts in relation to business management, planning and follow-up;
- 8) assess practice-based problems in the legal basis for contract establishment, as well as prepare business risk assessments;
- 9) assess and use current and relevant methods and tools to manage and plan production;
- 10) set up and choose digital systems and methods to optimise information flows;
- 11) apply and further develop building information models (BIMs) at relevant information levels with property data and in accordance with relevant project developments;
- 12) classify structures, building parts and components according to a cohesive and recognised classification system.

Competencies

In relation to the national subject element *Industry and prefabrication*, the student should have acquired competences to

- 1) obtain knowledge, skills and competences in a structured and cohesive manner;
- 2) participate in professional and cross-disciplinary cooperation with a professional approach;
- 3) cooperate with others on business establishment within the profession's work areas;
- 4) manage governance and management of small businesses in cooperation with others;
- 5) address the relationship between different technical/professional problems;
- 6) deal with development-based methods and systems for optimisation of the information flow in professional and cross-disciplinary cooperation projects applying a professional approach.

ECTS weight

The subject element *Industry and prefabrication* is worth 25 ECTS credits.

2.4 High-rise residential construction exceeding 3 floors (4th semester)

This subject element consists of a cross-disciplinary project in the form of a specific high-rise residential construction project exceeding 3 floors.

The subject element comprises 15 ECTS credits and includes the following subject areas:

Communication and cooperation (5 ECTS credits)

Production (5 ECTS credits)

Design-phase planning (5 ECTS)

Learning objectives for High-rise residential construction exceeding 3 floors.

Knowledge

In relation to the national subject element *High-rise residential construction exceeding 3 floors*, the student should have acquired development-based knowledge about

- 1) applied theory and methods, and should be able to reflect on relevant professional practice;
- 2) the relationship between different technical/professional problems and should be able to reflect on professional practice;
- 3) relevant social, environmental, financial and technological aspects in the production process;
- 4) relevant communication theories and methods, including digital media, for communicating building-technical problems;
- 5) complex production and execution methods;
- 6) complex structural designs, planning and management tools, and the student should be able to reflect on technical installations and statics principles in professional practice;
- 7) scientific-theoretical principles in professional practice and in specific subject-area practices.

Skills

In relation to the national subject element *High-rise residential construction*, the student should be able to

- 1) apply and master methods and tools to collect, analyse and process information;
- 2) communicate practice-based and technical problems and solutions to cooperation partners and users;
- 3) apply design-planning and production-technical methods and master the skills required in planning and managing relevant production processes;
- 4) assess practice-based problems as well as substantiate and choose relevant solution models;
- 5) apply a chosen management concept to planning in practice in the design phase and in the production process;
- 6) apply and interpret analysis and project material in production;
- 7) prepare and apply digital building information models (BIMs), as well as transfer and extract data between different information systems and technical models;
- 8) manage projects independently and cooperate with people from other professions, including communicate technical, production-related problems to other stakeholders;
- 9) combine and consider relevant experience, knowledge and research results in solving problems/performing tasks related to production processes;

- 10) analyse and understand complex problems related to design-phase and production processes, as well as work with others on solutions in a cross-disciplinary setting.

Competences

In relation to the national subject element *High-rise residential construction*, the student should have acquired competences to

- 1) identify own learning requirements and develop own knowledge, skills and competences;
- 2) deal with complex and development-based situations in a work context and perform documented analyses of building-technical and other relevant problems and their solutions;
- 3) apply acquired knowledge and skills associated with complex structural designs, planning and management tools, technical installations, statics principles and documentation;
- 4) work independently in technical and cross-disciplinary cooperation projects and assume responsibility within the framework of a professional code of conduct;
- 5) manage tools, standards and innovative processes in work contexts;
- 6) manage complex building information model (BIM) data, as well as exchange data between different systems for use in design-phase planning and production;
- 7) manage design-phase and execution processes with due consideration for relevant social, environmental, financial and technological aspects;
- 8) create innovative structural design solutions with a view to optimising production.

ECTS weight

The subject element *High-rise residential construction exceeding 3 floors* is worth 15 ECTS credits.

2.5 Renovation (5th semester)

The subject element *Renovation* consists of a cross-disciplinary project involving planning and design-phase planning of a specific renovation project.

The subject element comprises 15 ECTS credits and includes the following subject areas:

Production (5 ECTS credits)

Design-phase planning (10 ECTS credits)

Learning objectives for Renovation

Knowledge

In relation to the national subject element *Renovation*, the student should have acquired development-based knowledge about

- 1) the relationship between different technical/professional problems and should be able to reflect on professional practice;
- 2) relevant communication theories and methods, including digital media, for communicating building-technical problems;
- 3) complex structural designs, sustainability, planning and management tools, and the student should be able to reflect on technical installations and statics principles in professional practice;
- 4) design-phase planning and execution methods, and the student should be able to reflect on relevant professional practice;
- 5) different renovation and refurbishment concepts with regard to energy optimisation.

Skills

In relation to the national subject element *Renovation*, the student should be able to

- 1) apply and master methods and tools to collect, analyse and process information;
- 2) communicate practice-based and technical problems and solutions to cooperation partners and users;
- 3) assess and understand social, cultural and ethical factors and conditions in relation to production;
- 4) assess, substantiate and choose theoretical and practice-based problems;
- 5) master tools and standards for documentation and communication;
- 6) substantiate and choose design-technical and sustainable methods in relevant design-phase and production processes;
- 7) apply methods in production process planning.

Competences

In relation to the national subject element *Renovation*, the student should have acquired competences to

- 1) identify own knowledge and learning requirements based on knowledge, skills and competences acquired from completing the national subject elements, and translate this into professional practice;
- 2) manage complex tendering processes in work contexts, independently and in cooperation with other professionals;
- 3) deal with the management of complex building projects, in terms of the project's technical, time-related, financial as well as legal aspects;
- 4) deal with the planning, quality assurance and management of production in complex building and construction projects, independently as well as in cooperation with people from other professions;
- 5) manage the communication between users, clients, authorities, consultants and contractors (design and execution phases) about the production of complex building and construction works or building components;
- 6) consider relevant social, environmental, financial and technological aspects in the production process;
- 7) deal with complex and building-technical solutions on the basis of documented analyses of building-technical and other relevant problems and their solutions;
- 8) direct and manage design-phase and execution processes in renovation and refurbishment projects with due consideration for relevant social, environmental, financial and technological aspects;
- 9) work independently in technical and cross-disciplinary cooperation projects and assume responsibility within the framework of a professional code of conduct;
- 10) document the planning of own work on the basis of principles of self-management.

ECTS weight

The subject element *Renovation* is worth 15 ECTS credits.

2.6 The number of exams in the national subject elements

National subject elements for the 1st year of study (1st and 2nd semesters) constitute 60 ECTS (at least 45 ECTS credits out of the programme's national subject elements total), of which at least 45 ECTS credits are included in the exam(s), which make up the first-year exam.

In addition, there are 3 exam(s) (3rd, 4th and 5th semesters) in the other national subject elements, as well as one further exam in the Bachelor project (7th semester). For the number of exams in the internship (6th semester), please refer to section 3.

For a comprehensive overview of all the programme exams, please refer to the institutional part of the curriculum, as the national subject elements described in this curriculum can be examined together with the subject elements specified in the institutional part of the curriculum.

3. Internship

Learning objectives for the programme internship

Knowledge

The graduate should have acquired development-based knowledge about and should have reflected on:

1. the practical work of the profession in the context of the business in question (place of internship), and
2. the organisational, financial, administrative, and social and work-related factors and conditions at the business in question (place of internship).

Skills

The graduate should be able to

1. apply and master the methods and tools of a Bachelor of Architectural Technology and Construction in relation to relevant employment;
2. assess theoretical and practice-based problems in the internship, as well as substantiate and choose relevant solution models; and
3. communicate practice-based problems and solutions to the place of internship and other stakeholders.

Competences

The graduate should have acquired competences to:

1. manage and translate complex and development-based problems in work contexts into practice-based solutions at the business in question (place of internship);
2. identify own learning requirements and develop own knowledge, skills and competences in relation to practice;
3. deal with complex and development-based situations in work contexts;
4. work independently in technical and cross-disciplinary projects and assume responsibility within the framework of a professional code of conduct;
5. work with technical and complex problems in the work areas relevant for the profession at the business in question (place of internship), and
6. work independently or with others to solve theoretical and practical problems at the business in question (place of internship).

ECTS weight

The internship is worth 30 ECTS credits.

Number of exams

The internship is finalised by an exam.

4. Requirements for the Bachelor project

The learning objectives for the Bachelor project are identical to the programme learning objectives listed above under point 1.

The Bachelor project should document the student's understanding of and ability to reflect on the practices of the profession and the use of theory and method in relation to a real-life problem. The problem statement should be central to the programme and profession, and it should be formulated by the student, possibly in collaboration with a private or public company. The educational institution is responsible for approving the problem statement.

Exams for the Bachelor project

The Bachelor project completes the programme in the last semester once all the preceding exams have been passed. Please refer to the current Ministerial Order on Examinations on Professionally Oriented Higher Education Programmes (the Exam Order) and to the institutional part of the curriculum.

ECTS weight

The Bachelor Project is worth 20 ECTS credits.

Examination form

Please refer to the current Exam Order and to the institutional part of the curriculum.

5. Rules on credit

Passed programme elements are equivalent to similar programme elements taken at other educational institutions offering this programme.

Students are obligated to inform us of any completed educational elements from another Danish or foreign higher education programme or any jobs which are likely to provide credit.

In each instance, the educational institution approves credit on the basis of completed programme elements and any jobs which meet the objectives of the subjects, the educational part and the internship parts.

The decision is taken according to an academic assessment.

For prior credit approval of studies in Denmark or abroad, students are required to document each approved and completed programme element on the completion of these studies.

In connection with applying for prior credit approval, students give permission that the educational institution can obtain the necessary information after completion.

On approval according to the above, the programme element is deemed to be passed if it was passed according to the rules of the programme in question.

6. Commencement and transitional schemes

This curriculum will take effect on 1 January 2019.

The curriculum of August 2016 will be repealed at the same time.