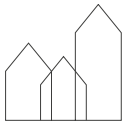


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SEMESTER SYLLABUS 3RD SEMESTER INDUSTRIAL BUILDINGS AND PREFABRICATION AND ELECTIVE PROGRAMME ELEMENT

Bachelor of Architectural Technology and Construction Management
AP Degree programme in Construction Technology

VIA University College Aarhus

Spring 2018

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SEMESTER SYLLABUS

Welcome to the 3rd semester!

You have now reached the first semester in the study environment we call 'professionalization'. The academic level increases and what we expect from you will be more in line with what a future employer will expect from you.

We now expect that you are familiar with your own learning style and that you reached an understanding of the Problem Based Learning approach (PBL).

The theme of the semester project is 'Industrialized Building Design'.

So far you have worked on designing houses. During this semester, you will learn about the link between designing an industrialized building, organize the production of the building components and planning the construction. Furthermore, the focus will be on pointing out which tasks the consultant, manufacturer and building contractor attend to.

We emphasize that you get an understanding of how important good and timely communication is in relation to a building process.

In this semester, you will also have an elective programme element with the theme "Innovation and Entrepreneurship".

The main aim is that you gain knowledge about creativity, innovation and entrepreneurship. By the end you should be able to take part in innovative processes in an interprofessional context.

In your future work with projects, we expect that you use what you have learned.

By the end of this semester, you have to decide whether you wish to become an AP Graduate in Construction Technology after the 4th semester or to become a Bachelor of Architectural Technology and Construction Management after the 7th semester.

Consider what you want to work with, your economic situation and academic circumstances. If you have any doubts concerning your academic competencies or your decision regarding your education path we encourage you to talk to one of the student supervisors of this programme or one of your teachers.

Quality assurance and development

In the following links, you can find the latest action plans, developed by the programme management based on your assessments.

Find other action plans in relation to the work with quality assurance and development of the study programme on [Studynet \(Aarhus\)](#).

Join [VIA Bygningskonstruktør / Architectural Technology and Construction Management](#) on LinkedIn and become a part of a professional network with other students, graduates, teachers and employers.

Reading guide

To guide you about the different semesters in this programme, a semester syllabus has been developed for each semester. The semester syllabus contains three main sections:

1. The programme. This section describes the basic approach to the pedagogy and teaching-forms, including our expectations of you in terms of achieving the learning aims. This section also describes our work with quality assurance and development of the programme and the role you play in this context.

2. The semester. This section starts with a brief description of the overall planning of the semester, followed by a brief specification of requirements and prerequisites for admission on the semester as well as the overall learning objectives for the semester. Subsequently, you will find a detailed description of semester content, i.e. the cross-disciplinary project, including single subjects and other elements. Finally, the main section describes how to assess the fulfillment of your learning aims, through tests and evaluations, and what criteria form the basis for the evaluation.

3. The teaching. This section contains a description prepared by the semester team (teachers) detailing the specific project/case and includes a teaching plan and a list of references. The project work in the specific semester is planned by the teacher team and is tailored to meet the class and to the students' background. Consequently, there will be differences in the planning and organizing of teaching in Danish versus international classes. Likewise, differences may occur in the way teaching is planned and organized at the different campuses. Such differences level out as the programme progresses.

1 THE PROGRAMME

The Architectural Technology and Construction Management programme is organized as a full-time education with 7 semesters, equivalent to 210 ECTS-points. The Construction Technologist Programme consists of 4 full-time semesters corresponding to 120 ECTS-points. Each ECTS-point corresponds to a workload of 27.5 hours and each semester is organized over 20 weeks, including the exam. Hence, you are expected to spend approximately 41 hours per week on your education¹.

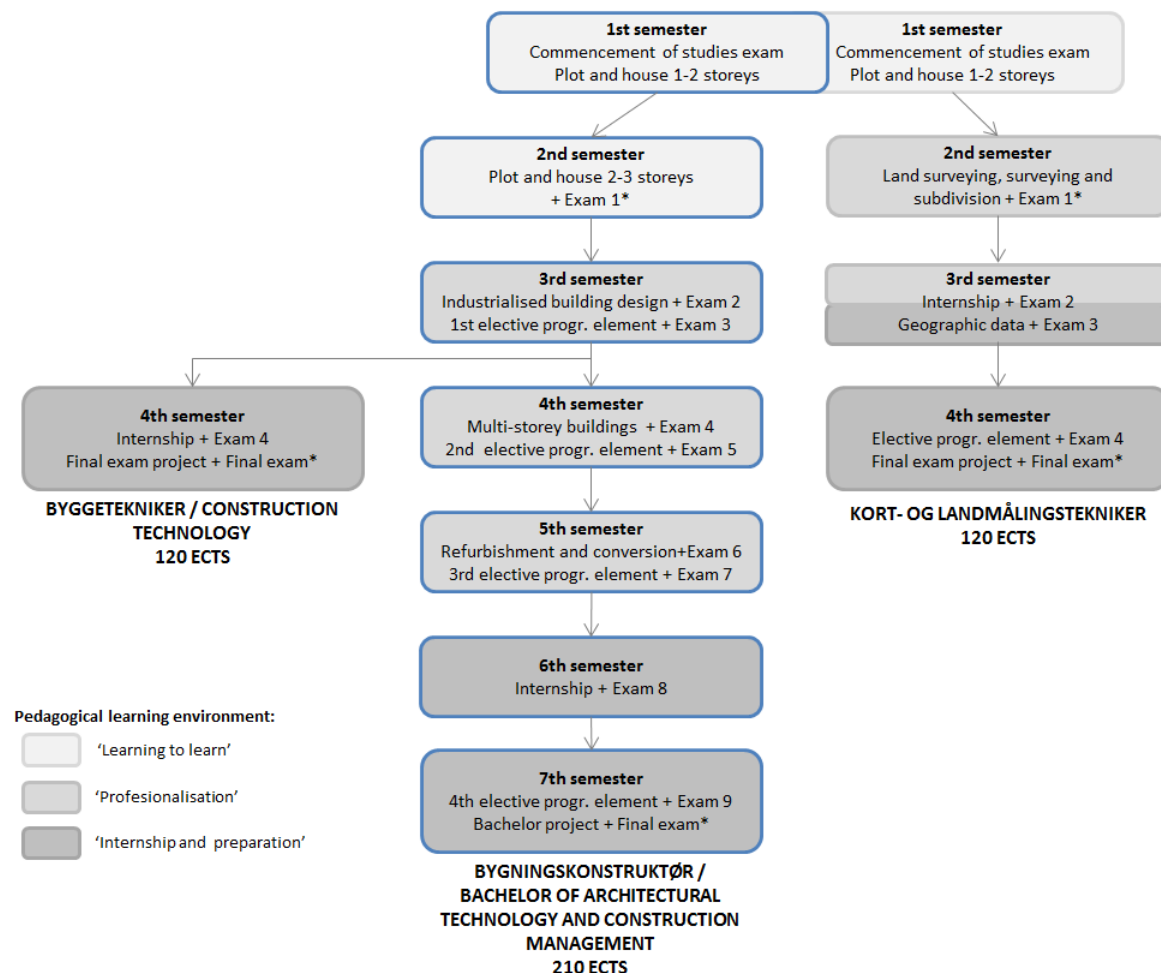
As a student, you have your own 'workplace' at the college, which we encourage you to use. The 'workplace' will change from semester to semester, depending on the size of the classes and your choice of specialization.

You also have access to resources and equipment made available to you by the campus. The type of resources and equipment may vary slightly from campus to campus.

1.1 The study environments

The programme is based on three different study environments, ensuring a natural progression in the learning during the course of the programme, see Figure 1:

Figure 1: The three study environments at VIA Built Environment



Source: Created at VIA Built Environment

¹ During the internship, a workload of approximately 37 hours/week is accepted.

"Learning to learn"

This environment emphasizes the learning of how to be a successful student – finding your own learning style and gaining good study- and work-habits. Furthermore, special emphasis is put on Portfolio as the controlling element which ensures focus on the process oriented approach.

"Professionalization"

This environment increases focus on the professional content of the projects. At the same time, your ability to learn yourself is enhanced. This happens in relation with you learning more about advanced methods for carrying out analyses.

"Internship and job preparation"

Through the internship in a company of your own choice, the elective programme element and bachelor project, you are required to immerse yourself further and independently into the relation between theory and practice.

1.2 Teaching- and workforms

The Architectural Technology and Construction Management programme is based on Problem-based Learning (PBL). That is, the turning point in each of the compulsory programme elements is one cross-disciplinary project. In the work with the project problems, the student develops and demonstrates gained knowledge, skills and competences across the academic areas of the semester.

To prepare the student as much as possible for the profession, the primary work form is group work. Other teaching and workforms are organised in relation to the project work. Theory lessons are primarily placed in the beginning of the compulsory programme element, as it is seen as general contributions within the theme of the semester.

Besides from this, the student has to seek and process anything else that might be relevant for carrying out the project.

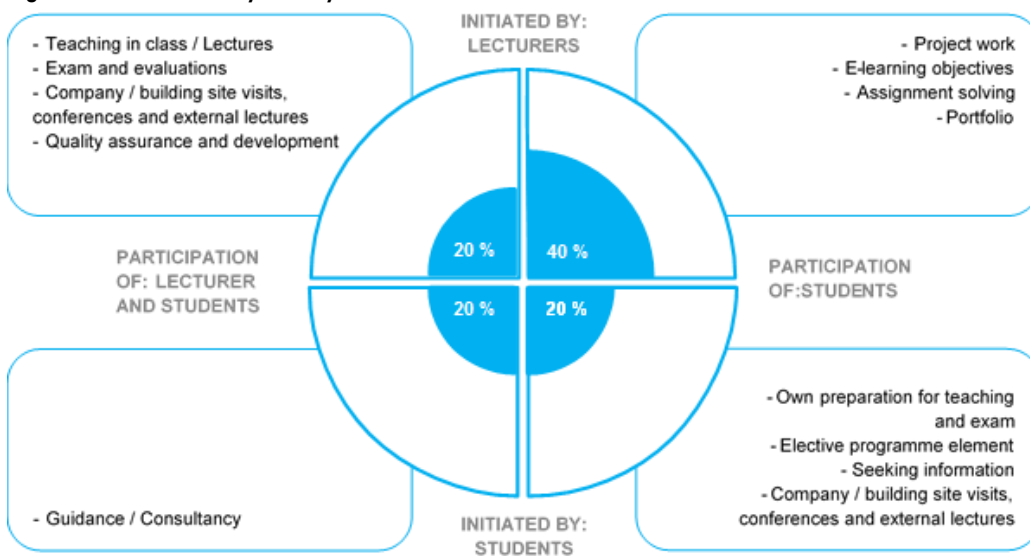
Portfolio is an important tool in the study programme, which you are to use to reflect upon your own learning.

The teaching- and workforms used in this semester are presented in the semester Study activity model.

The Study activity model clarifies partly that we expect you as a student to spend approximately 825 hours in each semester, partly that there are different types of teaching- and workforms which indicate that not all learning is initiated by a teacher and/or with the presence of a teacher. I.e., as a student you also carry a great responsibility for your own learning.

Hence the study activity model is also an illustration of what we expect from you as a student and what you can expect from us in relation to reaching the learning objectives.

Figure 2: Semester Study activity model

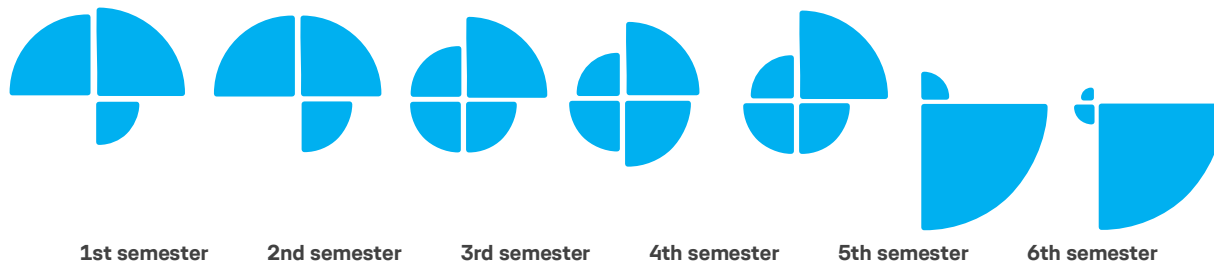


Source: Development at VIA Built Environment

The percentage distribution of hours in the four categories is an expression of the degree of independence we expect of you as a student.

If we look at the development in the semesterwise Study activity models it follows the development in the pedagogical learning environment.

Figure 3: Development in the semesterwise Study activity models



Source: Development at VIA Built Environment

All Study activity models can be found on the study programme's [website](#).

1.2.1 Individual learning offers

In addition to the scheduled and teacher-organized learning, you have many options of seeking new knowledge on your own. You can make use of the various offers of online teaching made available to you on 'Studynet' at this address: www.Openvia.dk. In this database, you can find numerous instructional videos and tutorials, which may support your individual learning. You may also find material that can support you in the use of certain it-tools or material that offers repetition of specific academic topics.

You are expected to make use these offers as a supplement to your own learning-process, and you are also expected to seek knowledge through other relevant services (such as the library).

In case you have additional need for special assistance during the programme, there are a number of individual possibilities at the different campuses, e.g. assistance in math, it, language or the like. The assistance may be offered in the form of short, specially organized courses or it could be assistance from a student in one of the higher semesters.

In case you have special needs in relation to your learning, it is your responsibility to make your teachers or the student counselors aware of such needs. In each case, the programme management assesses the possibilities of offering special assistance.

In order to be able to offer you optimal conditions for your studies, it is important that you inform the college about special study or learning needs that you may have.

1.3 Study activity / Attendance

As described in the Study Activity Model, you are expected to participate actively in classes, project work and guidance meetings. In other words, we expect that you:

- attend to class well prepared
- take part in discussions and exercises in class
- contribute positively to the group work
- procure literature recommended by your teachers and/or counsellors
- hand in compulsory assignments (these assignments must be approved for you to continue to the next semester)
- attend to meetings related to your education (status meetings, guidance meetings, evaluations, etc.) well prepared and motivated, and that you are able to document and demonstrate that you have reached the set goals

1.4 Quality assurance and development of the programme

We work systematically and goal-oriented with quality assurance and development of the study programmes at VIA Built Environment with regards to ensuring your learning and the content of the study programmes. This includes ensuring an updated knowledge base, the right academic level and the study programmes' relevance for the employers.

1.4.1 Your involvement

You and your fellow students play an important part in assuring and developing the quality of the study programme. It is important for the programme management and the teachers to get your feedback, partly to ensure that you and your fellow students gain a high learning outcome, partly to ensure a satisfactory study- and teaching environment.

From the table below, you can get an overview of how you as students are involved in evaluating the courses at and outside of VIA, who primarily uses your feedback and when the evaluations are carried out.

Table 1: The students involvement in evaluation of the courses at and outside of VIA

Element	Method	Primary users	Time
Alignment of expectation at the start of a new course at the institution	Dialogue at the Semester introduction with a starting point in the semester syllabus	Teachers and students	At the start of each semester.
Midterm teaching evaluation of a course at the institution	The Teacher team select a method	The teacher team	Approximately half way through the semester – is stated in the guiding time schedule.
Final teaching evaluation of a course at the institution	Online survey	The programme management and The teachers and the teacher team	Each semester is evaluated every 3rd time it is carried out. It will be stated in the guiding time schedule if the semester is to be evaluated.
Ongoing dialogue	Dialogue between the teachers, students and programme management, e.g. in the daily life or through the local DSR/KSR	Teachers and students	Continuously.
Quality assurance, incl. final evaluation of internship in Denmark and abroad	Among other things online survey	The programme management, internship coordinators and the international office	Each semester is evaluated every 3rd time it is carried out. It will be stated in the guiding time schedule if the semester is to be evaluated.
Quality assurance, incl. final evaluation of studies abroad	Among other things online survey	The programme management and the international office	By the end of each period of studies abroad.
Student satisfaction survey	Online survey	The programme management and VIAs upper management	Every 2nd year. It will be stated in the guiding time schedule if there is a Student Satisfaction survey in the given semester.

Source: Development at VIA Built Environment

You can find results, Key Performance Indicators and action plans on [Studynet \(Aarhus\)](#). Results from the latest evaluations are presented at the Semester introduction. Furthermore, your class representatives play an important part in passing on the main points from the DSR-meetings.

1.4.2 The local DSR (Student Council)

At VIA there is one [DSR](#) at each campus with class representatives from all the study programmes, but there is also local DSR's at the study programmes.

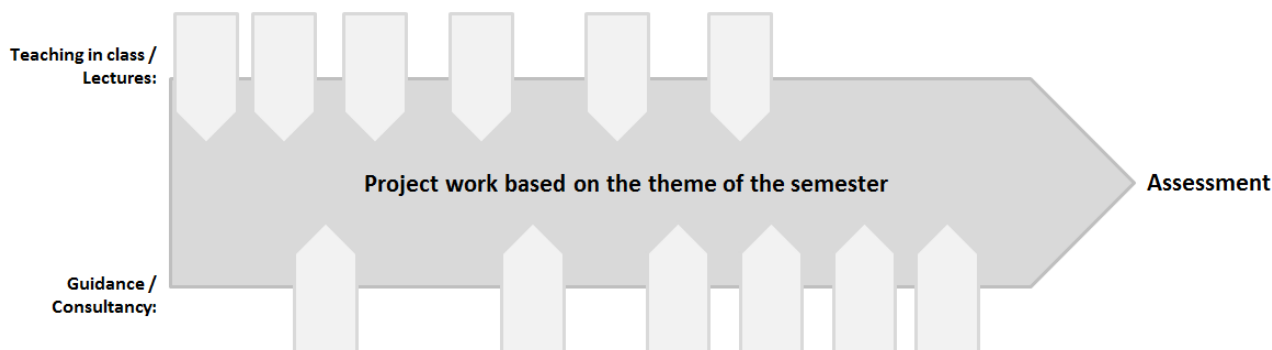
The programme management at VIA Built Environment in Horsens, Aarhus and Holstebro respectively continuously involve the local DSR in a discussion of the work with quality assurance and development of the programme, including:

- Employer involvement
- Graduate involvement
- Final Teaching Evaluation
- Final Evaluation of the Internship in Denmark and abroad
- Final Evaluation of Study Abroad
- The Student Satisfaction Survey
- Drop-out analysis
- The Quality Report

2 THE SEMESTER

During this semester, your studies will evolve around one continuous project in agreement with the overall semester theme. Figure 4 illustrates how single subject inputs support the project work. Theoretical inputs are often concentrated at the beginning of the semester, whereas guidance and consultancies in relation to the project are offered later in the semester. It is in the process towards solving problems that you demonstrate your development of competencies in order to become an AP Graduate in Construction Technology or a Bachelor of Architectural Technology and Construction Management.

Figure 4: Cross- disciplinary project work



Source: Created at VIA Built Environment

The 3rd semester is the first semester in the pedagogical learning environment “professionalization” (see Figure 1). Hence, for the first time there is an elective programme element of 5 ECTS-points in the semester (corresponding to three weeks). This elective programme element is an opportunity for you to explore your skills in relation to collaborating with students from other professions on relevant topics. You can gain important knowledge about your competencies which ought to inspire you, give you direction and professionalize you in your future studies. The elective programme element is an independently planned course.

2.1 Entrance requirements

In order to be admitted to the 3rd semester, you must have been registered for the exam in the 2nd semester, or be able to document that you in other ways have equivalent competencies.

2.2 Learning aims for the 3rd semester (transcribed from the curriculum)

In this section the learning aims for the compulsory part of the semester (25 ECTS-points) are described. The learning aims are transcribed from [the curriculum](#).

Knowledge

By the end of the compulsory programme element, the student should have knowledge of:

- the correlation between the various professional issues in relation to theme of the compulsory programme element
- relevant communication theories and methods to convey discipline-specific issues, including digital media within the theme of the compulsory programme element
- tools and standards in connection with the theme of the compulsory programme element
- industrial production and execution methods in relation to theme of the compulsory programme element
- industrial constructions, planning and control tools, technical installations, static principles and documentation in relation to the theme of the compulsory programme element
- mathematical and physical solutions in relation to theme of the compulsory programme element

- basic principles, theories, methods and tools related to managing business economics and personnel management
- the structure of rules of law and legal method
- basic rules in regard to the law of property within contractual law, law of torts and practice
- the opportunities and rules of the profession for setting up their own company
- corporate and organisational forms in connection with the establishment and operation of a business as well as the strategies and business plans that form the basis of their selection
- the social, cultural and ethical issues that have an impact on the establishment, operation and administration of a business
- applied principles, theories, methods and tools for project management of construction production in factories or on the construction site as well as be able to reflect on them
- digital systems and methods to optimise information flows in a building and construction project

Skills

By the end of the compulsory programme element, the student should be able to:

- use methods and tools to collect and analyse information within the theme of the compulsory programme element
- convey practice-related technical issues related to the theme of the compulsory programme element to relevant partners and users
- select and use relevant methods and tools for organising, leading, managing, administering and operating a business
- apply relevant legislation in relation to business operations and administration
- apply accounting principles for operating a business and use the industry's methods and tools for budgeting, bookkeeping and tendering
- apply the industry's methods, forms and standard contracts in relation to company management, planning and follow-up
- scrutinise the legal basis of contract formation as well as prepare a risk assessment in the company
- analyse, evaluate and use up-to-date and relevant methods and tools for production management and planning
- include digital systems and methods to optimise information flows in a building and construction project
- apply relevant building law
- apply and further develop an information model at a suitable information level and with suitable property sets with a view to production
- classify structures, construction members and components via a coherent and recognised classification system

Competences

By the end of the compulsory programme element, the student should have the competences to:

- identify their own knowledge and learning needs based on the knowledge, skills and competences acquired in the course of the completed compulsory programme elements
- independently take part in discipline-specific and interdisciplinary collaboration and take on responsibility within the settings of professional ethics
- apply the acquired knowledge and the skills included in the theme of the compulsory programme element to carry out substantiated analysis of discipline-specific relevant issues and their solutions
- analyse and select methods and systems to optimise information flows in a building and construction project

2.3 The project work

The project work is partly carried out as individual assignments and partly as assignments that need to be solved in groups of 2-4 students.

The work is carried out in groups, partly because this work form is commonly used within the building industry, and partly because you learn a lot when you have to collaborate problem oriented on a project with other students with different experiences.

Irrespective of the group work, it is important that you as an individual are able to acquire and put into use the knowledge you have obtained during single-subject teaching

Part of the project work includes analysis of aspects related to financial issues, architectural technology and management and the preparation of documentation necessary for the implementation of Industrialized Building Design.

The cross-disciplinary project, which comprises an industrial building, possibly with a joint administration building, is divided into three phases, namely **consultation**, **production** and **construction**.

Consultation focuses on the advisor role, and the starting point is an Outline Proposal for a multi-purpose sports building which will be further elaborated into digital tendering at Detail Design 1 level, i.e. including detailed specifications. However, in this semester the tender only includes works related to manufactory, delivery and erection of external walls, but building design will be continued to such a level as agreed between you and your consultants/teachers. Another group, preferably at a different college, will be invited to carry out the continued design work – thus allowing you to get experience in communicating with other professionals who have not been involved in the initial design work.

The production focuses on such issues as production calculation, production planning and the delivery of external wall elements.

Construction focuses on preparation of element erection. The elements to be erected are those offered in tender by the group mentioned above (under 'Calculation'). Submission of tenders is included in this part.

During Intermediate and final evaluations of your project work you must document your ability to put into practice - analytically, competently and professionally - the theory, the knowledge and the skills you have acquired through the single-subject teaching in such a way that you can:

- solve explicit tasks across subjects, education and organization
- assess and design such building structures and construction details as related to element construction with focus on minimizing energy consumption as well, focusing on overall economy including such issues as environmental impact and cycle
- handle the design work and optimize the building process and also ensure that the basic architectural expressions as well as technological solutions are maintained throughout the design, the production and the construction phases
- communicate - in writing and verbally - issues related to administrative project management with regard to solving the cross-disciplinary assignment
- handle the planning and the management of team-based project work as well as the planning of the design, the production and the erection of external wall elements
- assess and handle such financial aspects as may be related to a business dealing with consultancy/design, production and element erection
- use the analogue and digital tools specified in the single-subject learning-aims and in the case-description

Your success in meeting the above mentioned objectives, demonstrates the level of your professional competencies upon completion of the 3rd semester. Including the ability to collaborate on limiting and defining the project work.

2.3.1 Single-subject teaching

The single-subject teaching concerns rules, theories, methods and techniques within each specific academic field. The timely placement of each topic can be seen from the semester team own teaching plans, which will be available on Study net.

Fejl! Henvisningskilde ikke fundet. show which single subject each main subject consists of. The topics are described separately in the following subsections.

Table 2: Subjects and topics

Main subject	Single subject	Duration
Building Design (BDS)	Architecture and Building Design (ABDS)	1 ETCS-Point
	Building Design (BDS)	5 ECTS-points
	Material Science (MSC)	2 ECTS-points
Structural Design (STD)	Structural Design (STD)	2 ECTS-points
Building Services (BSE)	Building Services and Building Physics (BSE/BPHY)	3 ECTS-points
Building Planning and Management (BPM)	Building Planning and Management (BPM)	7 ECTS-points
Communication (COM)	Communication and Study Techniques (COM)	2 ECTS-points
Law (LAW)	Law (LAW)	3 ECTS-points
The Elective programme element	The Elective programme element	5 ECTS-points
Total duration of the semester:		30 ECTS-points

Source: Created at VIA Built Environment

2.3.1.1 Building Design (BDS)

The learning aims and content of the subject is shown in the following subject boxes.

Subject box 1: Architecture and Building Design (ABDS)

Duration	1 ETCS-Point
Learning aims – Knowledge	You must gain knowledge about: <ul style="list-style-type: none"> - the terms, methods, and practice of the subject - the history of modular building and architectural effects in relation to the theme of the semester - the interrelationship between functional requirements, material choice, aesthetics as well as sustainability within industrialized building design
Learning aims – Skills	You must be able to: <ul style="list-style-type: none"> - analyze functions, constructions and selection of materials and to make independent and qualified general choices that are related to architecture - work with sketching as a tool to design and disposition
Content	<ul style="list-style-type: none"> - architecture and building design in relation to the theme of the semester - sketching and communication of construction through analogue and digital tools

Source: Created at VIA Built Environment

Subject box 2: Building Design (BDS)

Duration	5 ECTS-points
Learning aims – Knowledge	You must gain knowledge about: <ul style="list-style-type: none"> - basic principles in addition to the practical use of methods and techniques used in the planning and construction of buildings with great stress using industrialized building processes and prefabricated elements - the basic principles in building component design in relation to Scheme Design, Detail Design 1 and Detail Design 2/Production design and Construction with a focus on prefabricated components - contemporary construction principles and construction types with regard to industrialized production, energy and sustainability - legislation for construction of prefabricated elements for 1-2 storey buildings

	<ul style="list-style-type: none"> - analogue and digital tools in sketching and communication of construction
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - analyze and select prefabricated elements used in industrialized building systems with great stress - plan and develop a prefabricated building from Scheme Design through parts of authority approval to the final construction - prepare the necessary specifications and communicate practical and professional information and solutions concerning pre-fabricated construction throughout the design phases as well as the construction phase, using digital systems
Content	<ul style="list-style-type: none"> - work with Scheme Design, Detail Design 1 and Detail Design 2 on the basis of a given Outline Proposal for a building with great stress - work with Outline proposal (Advisor) - Work on design in manufacturing and installation of building components

Source: Created at VIA Built Environment

Subject box 3: Material Science (MSC)

Duration	2 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - building materials and their application in prefabricated construction, including the compilation of the materials, their features, preparation, standard requirements, environmental effects, protection, trade forms, maintenance, life cycle assessment, social, cultural and ethical issues, and removal/recycling - production tolerances, building-in tolerances and quality control
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - analyze and select materials for constructions - justify and document your selection of materials
Content	<ul style="list-style-type: none"> - wood in relation to element production - concrete in relation to element production - joints (sealing materials), panels, heat insulation materials - work with material analyses and specification in building component log/building component analysis in drawings and in tender description - analogue and digital tools in sketching and communication of construction - visit to a relevant company

Source: Created at VIA Built Environment

2.3.1.2 Structural Design (STD)

The learning aims and content of the subject is shown in the following subject box.

Subject box 4: Structural Design and Mathematics (STD/MATH)

Duration	2 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - different types of prefabricated load bearing and non-load bearing constructions in relation to the theme of the semester - the structural system in relation to the theme of the semester - load transferring joints - the structural function of the 'light' as well as the 'heavy' part of the building - dimensioning and construction of prefabricated facade elements - basic principles applied in the use of communication tools used in Digital Design
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - identify and account for the structural systems

	<ul style="list-style-type: none"> - Select the relevant information and communicate the structural system and the structural ways of the loads through the structures - identify and account for load transferring joints - carry out an estimated structural calculation and prepare work drawings for element production - apply appropriate characteristics in relation to statics demands in a BIM model - undertake collision and consistency control on drawing extracts - analyze and identify optimal ways of breaking up prefabricated elements with respect to structural demands and loads and at the same time consider sustainability aspects in relation to production, transport and element erection - describe the correct physical handling of prefabricated elements and account for the different types of lifting devices used for the handling of prefabricated elements
Content	<ul style="list-style-type: none"> - Structural analysis - Load transferring joints and load transfer - Estimate and communicate structural calculations and detail drawing of prefabricated elements - Estimate dimensioning of lifting devices - lifting methods - Bracing and anchoring

Source: Created at VIA Built Environment

2.3.1.3 Building Services (BSE)

The learning aims and content of the subject is shown in the following subject box.

Subject box 5: Building Services and Building Physics (BSE/BPHY)

Duration	3 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - different heating systems used in larger buildings and offices - different ventilation systems for buildings other than residential buildings - requirements for energy consumption and calculation of the building's energy frame - sources which may affect the indoor climate and energy consumption of the project in question, including proposed solutions for optimizing the indoor climate
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - prepare drawing material concerning selected technical installations for the application of building permit (e.g. ventilation, sewer, water, and heat) - calculate dimensioned transmission loss for the building envelope - calculate the energy frame for the building envelope including windows and shadows - estimate and, in collaboration with ventilation experts, select a suitable ventilation system for the specific project
Content	<ul style="list-style-type: none"> - principles for heating systems used in larger buildings - principles used in balanced mechanical ventilation systems - plans and principles for the running of sewer, water, heating and ventilation pipes - ventilation plan for prefabricated elements of concrete and wood respectively - introduction of Revit MEP (Mechanical - Electrical and Plumbing) - moisture in buildings

Source: Created at VIA Built Environment

2.3.1.4 Building Planning and Management (BPM)

The learning aims and content of the subject is shown in the following subject box.

Subject box 6: Building Planning and Management (BPM)

Duration	7 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - team collaboration and resource management enabling you (and your group) to work efficiently towards specific goals solving complex problems - organizational structure, the role of the leader in an organization and different forms of organization set-up - organization, administration and financial management of building enterprises – emphasis on design and project management - types of tender, contract types, and contract delimitation - relevant directions from DANSKE ARK and FRI –including tools used for scrutinizing and output specifications including BIPS specification tools - calculation of building costs including considerations with respect to total economic value in relation to manufacture and maintenance - ‘The Working Environment Act’, Work Safety in production enterprises and Plans for Health and Safety (PHS) - relevant production technology and acts on environment and safety - quality assurance procedures – performing quality control in relation to production and erection/fitting of building components – including tolerances accepted - BIM and Digital Design including the use of ‘Project Hotel’ - transportation and building site logistics in relation to erection of element
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - collaborate and to work individually on the planning and implementation of teamwork, as well as the follow-up on guidance meetings - plan project work efficiently, i.e. group work as well as individual work - introduce and use a suitable document structure on group work, including the numbering of drawings - use current methods for the planning and controlling of project work, i.e. as a planner / designer (architect’s office), as a producer (element manufacturer) and as a contractor (erecting elements) - perform successive calculation - scrutinize an Outline Proposal and a Scheme Design and use the results of this analysis in the continued design process (follow up) - scrutinize tender documents and prepare delivery control plans - make calculations with increased detailing throughout the project phases, including a tender price of the element contract, based on supplied tender documents - use currently acknowledged methods in the elaboration of documents required for tendering of the element contract which include legal as well as technical aspects - communicate practical and technical problems related to the starting up and operation of a company, including budgeting, organizational issues, production planning, submission of tenders, and reflecting upon and communicating such aspects - specify the manager’s role and responsibility in a production company, including the responsibility to act as ‘communication catalyst’ - plan and organize factory production of elements - use a relevant platform for the exchange of project materials - plan the erection of elements including health and safety (H&S) risk assessment for own work and an assessment of the Plan for Health and Safety (PHS)
Content	<ul style="list-style-type: none"> - transportation logistics - study planning, teamwork and resource management - industry and technology - types of enterprise and types of tender - construction planning - calculation, taking off and tender documents - total economic value - building component log - quality assurance

	<ul style="list-style-type: none"> - building site arrangement - plan for Health and Safety (PHS) - refuse handling - production planning techniques - organizational chart for manufacturing companies - production flow and division of labour - collaboration between parties involved at the building site with the objective of reducing errors and shortcomings - financial control models used in small consultancy companies (building), manufacturing companies and construction contractors - construction documents and specifications - transport logistics - manufacturing and fitting tolerances
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Source: Created at VIA Built Environment

2.3.1.5 Communication (COM)

The learning aims and content of the subject is shown in the following subject box.

Subject box 7: Communication and Study Techniques (COM)

Duration	2 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - what characterizes the effective team - the requirements for professional communication focusing on graphic communication (drawings) and mail correspondence - common English expressions relevant to construction (building on 2nd semester)
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - writing the portfolio taking into consideration the new pedagogical environment: <i>professionalization</i> - collaborate with your group, and independently plan, implement and follow-up on guidance meetings - use the basic principles of PBL more consciously in your studies - incorporate your own as well as other team members' personal skills or learning styles in the teamwork - describe models and systems that affect the group work, such as motivation, group organization, roles, conflicts, etc. - communicate in writing, both to partners and users, concerning problems and solutions relating to real-life situations - make a short presentation in English focusing on construction technology (building on 2nd semester)
Content	<p>Collaboration/study technique and learning:</p> <ul style="list-style-type: none"> - the effective team – definition, development and challenges - writing the portfolio focusing on professionalism - <p>Presentation:</p> <ul style="list-style-type: none"> - professional communication including graphic communication (drawings) and mail correspondence

Source: Created at VIA Built Environment

2.3.1.6 Law (LAW)

The learning aims and content of the subject is shown in the following subject box.

Subject box 8: Law (LAW)

Duration	3 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - The legal rules and the legal method - The general law of contracts focused on formation of contract and interpretation - the standard agreements of construction of buildings - focusing on the roles of the parties and their responsibilities in the various contractual forms according to GC/ABR 89, GC/AB 92 and GC/ABT 93 - 'the law of torts' inside as well as outside a contract - practice within the specified areas - the importance of the procurement rules for the semester case - the professional opportunities and rules for establishing own business - corporate and organizational forms in connection with the establishment and operation of companies, including liability and bankruptcy
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - explain the chosen type of contract and its characteristics in relation to other usual types of contracts - explain the set of rules for tendering in relation to the semester case - scrutinize the legal basis for contracting and prepare a legal risk assessment in the company - prepare contracts and apply GC/AB 92 with focus on the client-contractor-supplier relationship concerning risk management, time management and financial management for the contractor, especially related to defects, time / delay and payment.
Content	<ul style="list-style-type: none"> - the legal hierarchy - the legal method - basic contract law - the standard agreements on construction (roles and responsibilities) - basic right of compensation inside/outside contracts - basic contract law, incl. rules of interpretation - procurement law related to the semester-case as time and risk management in the tender phase - company law (individual or capital companies) - debt liability and bankruptcy - GC/AB92 focusing on the client-contractor relationship for risk management, time management, and financial management for the contractor - involvement of court cases, arbitration cases and procurement practice <p>Focus on the relationship between Bra and E</p>

Source: Created at VIA Built Environment

2.3.2 The Elective programme element

The learning aims and content of the study element is shown in the following subject box.

Subject box 9: The Elective programme element

Duration	5 ECTS-point
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - specific areas of your own undertakings as well as the undertakings of other professions, yours/their competences and responsibility - core areas in cross-disciplinary professionalism - essential concepts related to creativity, innovation and entrepreneurship

Learning aims - Skills	You must be able to: <ul style="list-style-type: none"> - identify particular challenges and ways of acting in cross-disciplinary collaboration - enter into innovative processes used in cross-disciplinary contexts - bring your professional knowledge into play in new and innovative ways
Content	<p>You will be informed of this activity by the start of the semester and immediately before execution. The elective programme element is organized and implemented differently at each campus.</p> <p>You are obligated to participate in the elective programme element.</p> <p>In this elective programme element you will work partly at your own programme, partly in a team with students from other programmes.</p> <p>Through participation in creative, innovative and entrepreneurial processes you should come up with a solution to a specific welfare challenge presented by external collaboration partners.</p>

Source: Created at VIA Built Environment

2.4 Tests and evaluations

At the end of the semester, a final test is carried out. You and your group present the interprofessional project. Following, you will receive an individual assessment, partly for the group work and partly for the independent part of the project.

Only in case of lacking study activity or too large shortcomings in the prerequisites you will be guided to start the semester again, or in the worst case scenario, drop out of the programme.

Table 3 is an overview of the different study elements and their evaluation before or in relation to the final test.

Table 3: Study elements and their assessment

Study element	Evaluated before the final test	Evaluated in the final test
Exam 2: Project work in relation to 'Industrialized Building Design'		X
Wood, Concrete, Moisture		X
Exam 3: The Elective programme element (Innovation and entrepreneurship)	X	
Portfolio	X	X

Source: Created at VIA Built Environment

Find general information about the exam on [Studynet \(Aarhus\)](#).

2.4.1 Evaluation of the project

The assessment criteria are defined as:

- Method and process (knowledge, skills, competency)
- Technical solutions and documentation (knowledge, skills, competency)
- Oral presentation and defense (knowledge, skills, competency)

Essential parts of the project must be presented digitally / orally followed by oral examination by the teachers.

In the 3rd semester emphasis is put on you professionally and independently is able to understand and act in the different roles in relation to design, industrialized component production and construction planning respectively of bigger buildings like industrialized buildings or gyms etc..

Your professional approach will especially be assessed by your skills to figure out, implement and communicate the relevant and necessary descriptions and drawings related to each of the different phases and roles you get in this semesters interprofessional project from consultant to production management to project manager, including your ability to present and defend this to your fellow students and your teachers.

When digital presentation is used at the ATCM-programme in relation to evaluation / the final test, we refer to the [current guide](#).

3 TEACHER TEAM SPECIFICS

The project or "The Case" in the 3rd semester is planned by the team of teachers with reference to this template:

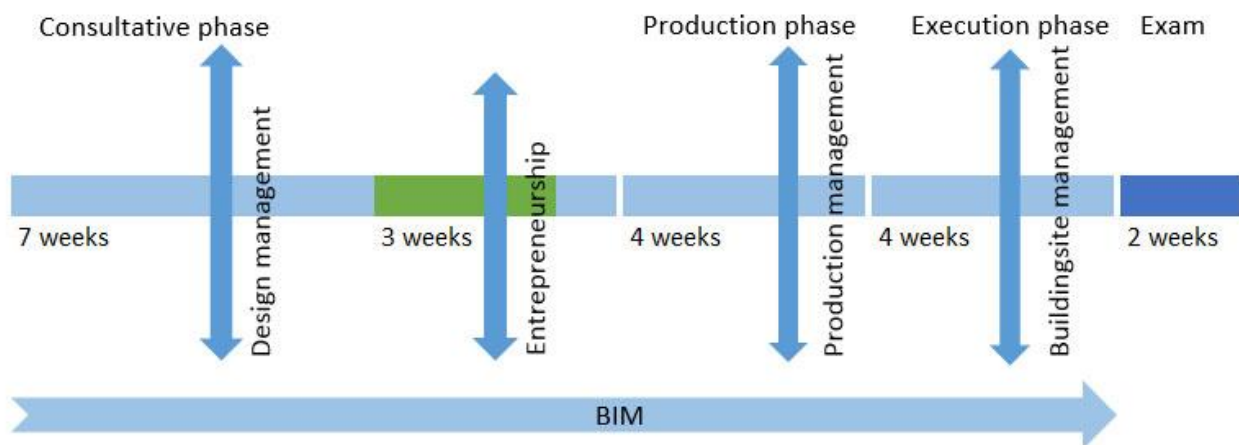
You should imagine that you are working on an architectural design studio as a counselor, and must continue designing an outline proposal, which the architect has drawn. You will design the proposal through scheme design proposal and detail design 1. Tender will only include the facade elements based on functional requirements. You have a role as **design manager** throughout advisor phase.

After the offer, you will receive tender documents (on the facade elements) from another group.

Since the external elements is produced by a manufacturing company, you will during that period, have a role as **production manager** doing the design of the elements and calculating the costs for the delivery.

Hereafter you now have the role as a **building site (contract) manager** where your task will be to give a price bid based on the tender documents for the delivery including assembly work of the external concrete elements or timber panels and then plan the mounting work and logistics.

The case will describe in greater details what happens in the 3 different roles



Entrepreneurship and Innovation

Entrepreneurship and Innovation is a cross-profession projectwork across professional education programs in the VIA framework.

The course focuses on inter-disciplinary and innovative skills in relation to collaborate on real-life cases. The course is based on an optional challenge by a client which must be addressed together in cross-professional group.

The finished product is presented to the client at the end of the course.

3.1 Guiding time schedule

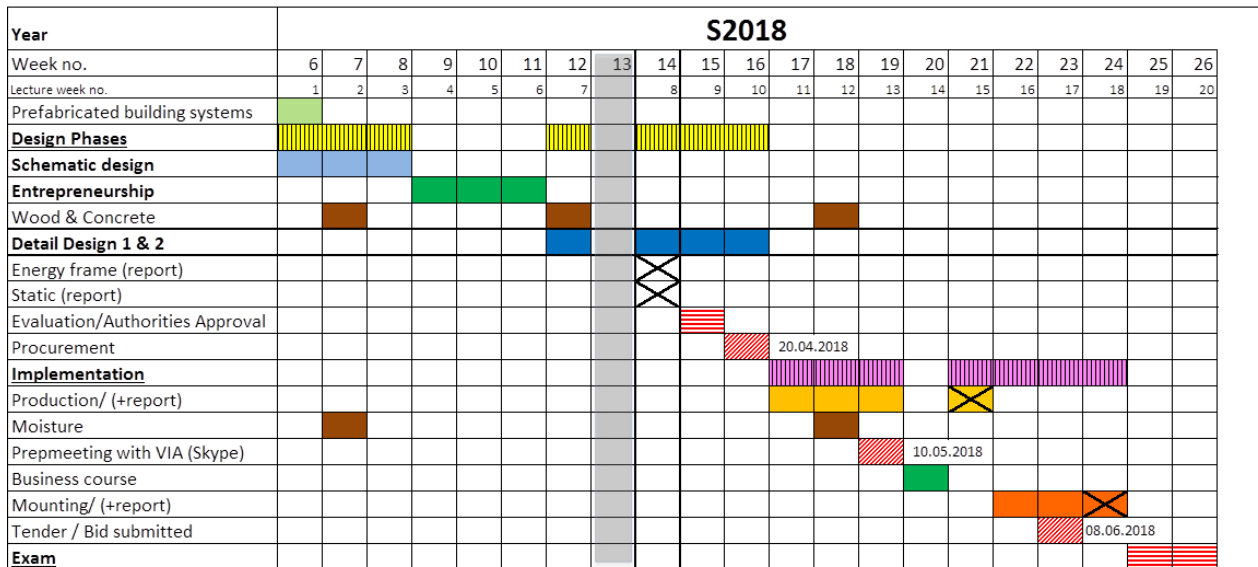
To the extent possible, the semester will proceed in accordance with the guiding time schedule presented in Figure 55.

Figure 5: Guiding time schedule


ATCM-3 / int

Semester course guide

Syllabus



30-01-2018/ Team ATCM-3

 * Interaction/ exchange w. VIA Horsens

 * Handing in report

Source: The semester team's creation

3.2 References and knowledge base

3.2.1 Cross-disciplinary references

- [ICT and BIM](#)
- Building regulations 2015
- SBI 216, guidelines on Building Regulations
- Broch O B, Moesgaard J, 2008, Design Methodology Ny Tekniske Forlag , Copenhagen
- The Constructing Architects Manual.
- Hovmand, U.A. & Andersen, N.M. 2006, *Illustrated Building Dictionary, Dansk-Engelsk/English-Danish*, Huset Hovmand Aps, Birkerød
- Pierce, M. 2004, Building English, English for the construction industry, Systime, Århus
-

3.2.2 Single-subject references

- **BDS**
Protection against fire in buildings
Fire technical examples - Published by Danish Institute of Fire and Security Technology
<http://www.betonportal.dk/bind2/indholdsfortegnelse.htm> (Danish)

WOOD 56
TRÆ 50, 55 (Danish)

- **ABDS**
Danish architecture since 1754, The Danish Architecture Press.
Guide to Danish Architecture 1, 1000 – 1960.
Danmarks arkitektur, Byens huse, Byens plan. Gyldendal.
Analyzing ARCHITECTURE, Simon Unwin, ROUTLEDGE.
Danish Architecture, Tobias Faber, Det Danske selskab
- BDS/MSK
- BDS/IT
www.students.autodesk.com
www.detdigitalebyggeri.dk
www.bips.dk
www.traecad.dk
- STD
Eurocode 0 Basis of structural design
Eurocode 1 Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings
Eurocode 1 Actions on structures - Part 1-3: General actions - Snow loads
Eurocode 1 Actions on structures - Part 1-4 General actions - Wind action
Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings
Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings
Eurocode 5 Design of timber structures - Part 1-1: General - Common rules and rules for buildings

Link to the Danish national annexes: <http://eurocodes.ds.dk/en/national-annexes/national-annexes-for-building-structures/>

Compendium – Concrete elements

- (STD/IT)
- (BSE)
Compendium – Ventilation & Indoor climate
Compendium – Drain and sewer systems
The space required to accommodate services – Guidelines for plumbers and architects
DS 418 – Calculation of heat loss from buildings
Calculation program Be10 - Energy requirements for buildings
Sbi-guidelines 213 – Energy requirements for buildings/calculation guide.
- (BSE/IT)
- (BPM)
Description of Services and planning 2012
General conditions for Consulting 89
General Conditions 92 (GC 92)
Handbook for project and construction management
Project Management Absolute beginner's Guide
The construction architect's manual
Manual - Working environment for building and construction

- (BPM/IT)
BIPS file and document structure A104
Project 2013 Absolute beginner's Guide
<http://bookboon.com/en> (Software, business, economics and more)
- (COM)