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VIA University College



SEMESTER SYLLABUS

4TH SEMESTER

MULTI-STOREY BUILDINGS – WITH DWELLINGS AND COMMERCIAL UNITS AND ELECTIVE PROGRAMME ELEMENT

Bachelor of Architectural Technology and Construction Management

VIA University College Horsens

Spring 2016

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SEMESTER SYLLABUS

Welcome to the 4th semester!

You have now reached the second semester in the study environment we call 'professionalization'. We now expect you and your fellow students to be able to work more independently than previously. You now have to be able to seek new knowledge, analyze problems and make well-founded decisions.

The theme of the semester project is 'Multi-storey buildings – with dwellings and commercial units'. Working with the project, you and your group will learn about increasingly complex demands to appliance, constructions and materials when designing and implementing a larger, contemporary building.

Furthermore, there is an elective programme element this semester where you have to write a report based on a topic of your choice.

This gives you the opportunity to shape your education in accordance with what you wish to do after the 7th semester.

In relation to the elective programme element, you will be introduced to the basic principles within philosophy of science – adjusted to the ATCM-programme.

During the course of this semester, you have to decide what direction you want to go in the 5th semester: architectural technology or construction management.

Quality assurance and development

VIA the following link, you can find the latest action plan, developed by the programme management based on your assessments:

- [Final teaching evaluation 3rd semester](#)

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

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.

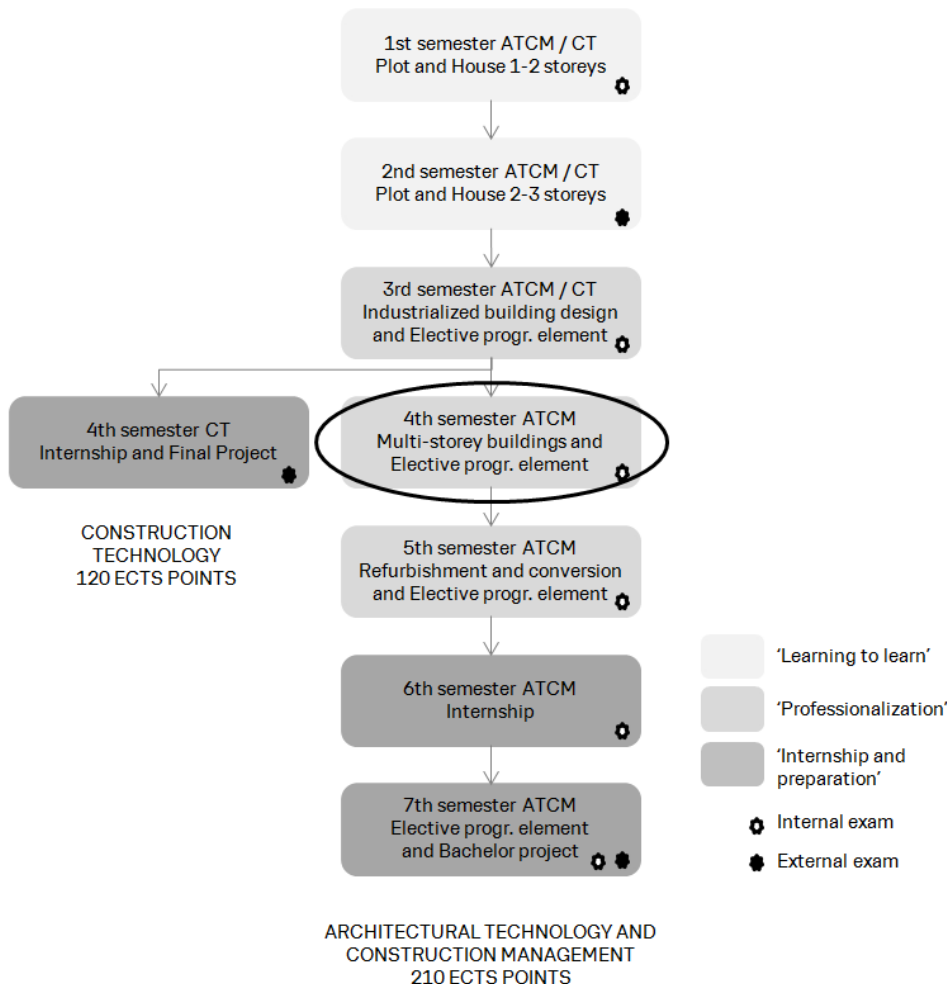
As a student, you have your own 'workplace' at the college, which we encourage you to use. The 'workplace' will change from semester to semester, depending on the size of the classes and your choice of specialization.

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 in a PBL (Project Based Learning) environment. It is also an introduction to the professional world of the Bachelor of Architectural Technology and Construction Management, and you acquire basic knowledge and skills concerning working methods and tools used within the profession.

"Professionalization"

This environment increases focus on the professional content of the projects and you learn more about advanced methods for carrying out analyses.

"Internship and job preparation"

Through the internship in a company of your own choice, and through your elective dissertation and bachelor project (defined within delimited areas), you are required to immerse yourself further and independently into theory and practice.

1.2 Teaching- and workforms

The programme has a varied teaching and learning environment – ranging from traditional teaching- and workforms with lectures to new teaching- and workforms with innovative projects carried out in cooperation with real companies.

As a student, you are responsible for your own learning, and we put much emphasis on that. The Study Activity Model accentuates which study activities the teachers will initiate, and which activities you should initiate. It also accentuates which activities both teachers and students participate in, as well as activities where only students participate (four categories). The model illustrates the distribution of time for each type of study activity in percent. It also illustrates the development in the pedagogical environment and consequently how you are expected to become gradually more and more responsible for your own learning as the programme progresses.

The programme is primarily based on Problem Based Learning (PBL), which means that the single subject inputs and assignments all relate to, and support the project work.

Lectures in theory, group guidance and independent project work are organized in relation to the specific class and most activities take place in the same classroom.

You are expected to keep yourself updated on relevant academic presentations regarding your career, labour union etc., which may be on offer during the semester.

During the programme, you are introduced to a tool called Portfolio. The use of this tool will help you in getting a better understanding of your strong and weak points, and consequently help you in finding out in which areas you need to increase your study efforts and in which areas you could possibly reduce your efforts.

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 of 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 counselors
- 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

	Method	Primary users	Time
Semester introduction	You and the teachers align your expectations to the semester with a starting point in the semester syllabus.	Students and teachers	At the start of each semester.
Portfolio	You reflect upon your own effort and what you have to do in order to reach your learning aims.	Students	Continually through the course of the study programme.
Midterm teaching Evaluation	The teachers select a method, typically it is orally.	The teachers	Approximately in the middle of the semester – it will be stated in the guiding time schedule.
Final Teaching Evaluation	You receive a mail with a link to the online survey from the study programme. In semesters where you can be gath-	Teachers The programme management	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

	ered in class, the teachers will discuss the results with you.		evaluated.
Final Evaluation of the Internship	You receive a mail with a link to the online survey from the study programme.	The programme management	
Final Evaluation of Study abroad	You receive a mail with a link to the online survey from the International Office.	The programme management The International Office	By the end of each semester.
Student Satisfaction Survey	You receive a mail with a link to the online survey from VIA Quality. The programme management invites the class representatives to a follow-up meeting.	The programme management VIA's 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 \(Horsens\)](#).

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.

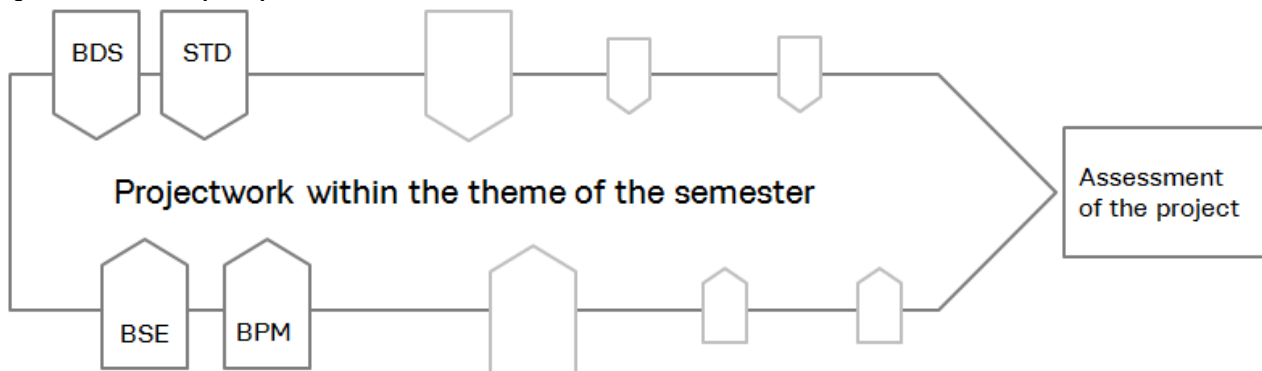
The programme management at VIA Built Environment in Horsens, Aarhus and Holstebro respectively continuously involve the local DSR in a discussion of the work with quality assurance and development of the programme, including:

- 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 2 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 by solving problems related to the given project 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 2: Cross- disciplinary semester



Source: Created at VIA Built Environment

In the elective programme element you get the opportunity to specialize. The elective programme element is an independent course of study during this semester.

2.1 Entrance requirements

In order to be admitted to the 4th semester, you must have been registered for the exam in the 3rd semester, or be able to document that you in other ways have equivalent competencies.

2.2 Learning aims for the 4th 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

At the end of the 4th semester, you should have learned:

- about and have the ability to reflect on the design of constructions, planning and management tools, technical installations, static principles, and documentation dealing with multi-storey residential buildings with commercial units
- about and understanding of general production and construction methods for multi-storey buildings with dwellings and commercial units, and the ability to reflect on these
- about general communication methods, tools and standards when designing multi-storey buildings with dwelling and business units

Skills

At the end of the 4th semester, you should:

- have the ability to use professional methods in the design of multi-storey buildings with dwellings and commercial units and use appropriate methods for planning the actual construction
- have the ability to assess different methods and approaches and be able to make an informed choice

- have the ability to convey the chosen methods and technical solutions to relevant collaboration partners

Competencies

At the end of the 4th semester, you should:

- have the ability to carry out appropriate analyses and documentation materials used for the execution of multi-storey buildings with dwellings and commercial units
- have the ability to manage and implement the design and production process of a multi-storey building with dwellings and commercial units, taking into account the prevailing social and technological circumstances.

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 are forced to collaborate 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.

Introduction

In groups, you undertake an investigation / registration of a modern multi-story dwelling. The research is documented in a report. This assignment serves as an introduction to, and inspiration for, the project work to be undertaken during the semester.

In addition, an architectural guided tour visiting modern multi-storey dwellings may be arranged.

The case

The starting point of the case is a client (a housing association) inviting tenders to bid on a turnkey contract (all inclusive) on a multi-storey residential building with a commercial unit. See section 3 for further information.

Compared to previous semesters, the project work on the 4th semester is slightly different. Everyone gets the same case, but can choose to focus on different areas in the second part of the project.

The Outline Proposal

Based on the 'client's brief' and the overall plot plan, you are (in groups) requested to carry out such analyses and sketches as required in order to present an Outline Proposal containing all aspects related to arrangement/layout, costing, planning and legislation.

You present the proposal to the client (your lecturers and possibly external professionals) as a turnkey project in competition with the other groups ('architects') in your class.

During the competition all proposals will be individually assessed and graded.

The Scheme Design

During the ongoing work, there will be an opportunity to work in depth with aspects related to building design (architectural technology) as well as project implementation (construction management). Thus, the distribution of work will become clearer.

As an architectural technologist, it is your task to develop the project from the Outline Proposal towards Detail Design 1 and Detail Design 2, covering minimum one trade contractor in such a detail that it will be possible to invite bids from a sub-contractor. You will put special emphasis on such elements as stairs, balconies, wet rooms and installation shafts.

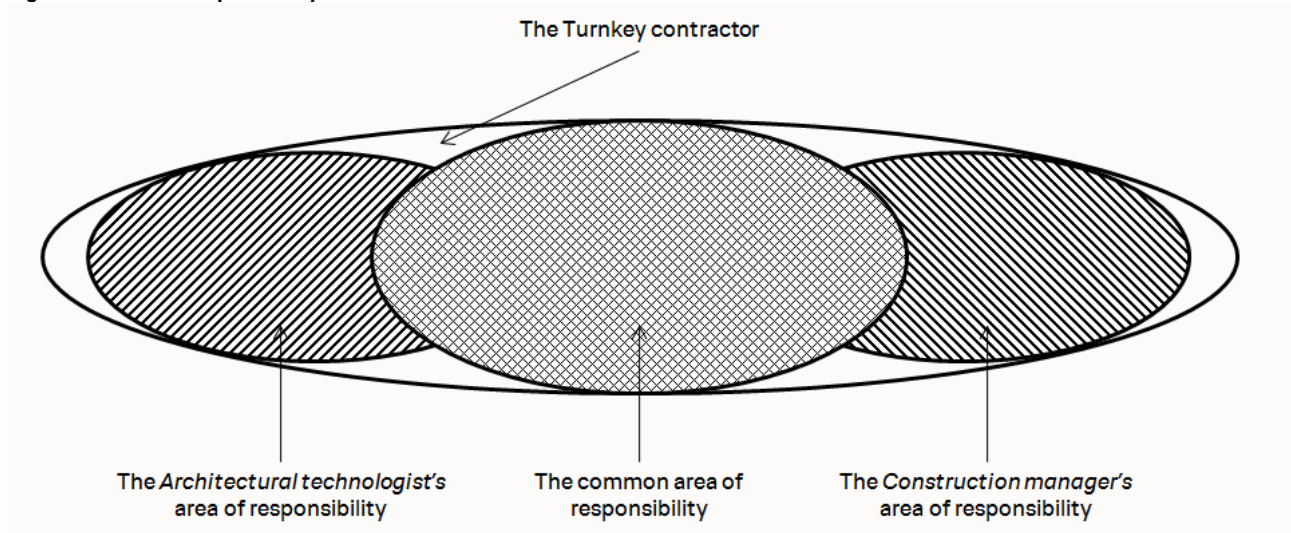
Working with project implementation (as a construction manager / executing contractor), you have to further develop the planning and execution of excavation/earthwork, sewer and concrete work or similar works. This work is carried out by the turnkey contractor as own production.

Architectural technologists and Construction managers

In your work with Portfolio, you may have formulated personal learning aims reflecting your wishes for specializing in the education. You may have reached the conclusion that you want to become an architectural technologist, a construction manager or a generalist. It is your choice. However, you should discuss your choice with your teachers.

Figure 3 illustrates the different areas of responsibility and is followed by examples within each area.

Figure 3: Areas of responsibility



Source: Created at VIA Built Environment

As an architectural technologist, you are responsible for:

- Main drawings
- Room drawings
- Building component drawings
- Completions
- Detail drawings
- Specifications

As a construction manager, you are responsible for:

- Working drawings for excavation/earth work (and possibly sewer work) in own production
- Working drawings for concrete work (own production)
- Working drawings for optional works in own production
- Contractor calculations
- Drawings and specifications concerning the practical implementation of the construction work
- Detailed construction plans

Everyone is jointly responsible for:

- Basic structure
- Stability
- Planning of group work
- Tender time schedule
- Agreements
- Building site conditions
- Procedures for Health and Safety at tender level

It is very important that you carry out a complete Detail Design 2 on a given building component, including specifications, drawings, process plans, etc. due to the fact that there will be no focus on this later on in the programme.

Each group is responsible for its own planning and final distribution of tasks among group members.

At the examination, it is therefore important that the group starts by explaining how tasks and responsibilities have been distributed among group members.

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.

Table 2 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 ECTS-point
	Building Design (BDS)	9 ECTS-points
	Material Science (BDS/MSC)	1 ECTS-points
Structural Design (STD)	Structural Design (STD)	3 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)	6.5 ECTS-points
	Law (BPM/LAW)	1.5 ECTS-points
The Elective programme element	The Elective programme element	3.5 ECTS-points
	Philosophy of Science	1.5 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 ECTS-point
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - methods and practice applied within the construction of multi-storey buildings with dwellings and commercial units - the history of multi-storey dwellings well as knowledge about the building tradition used in the same field - architects who pay specific attention to sustainability and industrialization - low energy construction, including the influence of architectural design on energy consumption
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - design multi-storey dwellings, including the ability to use sketching as a tool to create rational plan solutions where form, function and architectural qualities form a synthesis
Content	<ul style="list-style-type: none"> - introduction to the overall semester theme: Multi-storey buildings with dwellings and commercial units - investigation of the theme: Multi-storey buildings with dwellings and commercial units - Sketching state-of-the-art multi-storey buildings with dwellings and commercial units with balconies and penthouse - adapted to an urban context

	<ul style="list-style-type: none"> - The sketching of plan solutions focusing on functional and architectural qualities as they are presented in Danish state-of-the-art residential buildings - Researching Danish and international architects who focus on sustainability and industrialization - Analogue and digital tools in sketching and communication of construction (See "BIM – Building Information Modeling" under References)
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Source: Created at VIA Built Environment

Subject Box 2: Building Design (BDS)

Duration	9 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - basic principles, as well as the application of methods and techniques used for the planning, designing and implementation of the proposal phases in a contemporary multi-storey building with dwellings and commercial units - gain insight into low-energy construction with particular focus on the design of building parts and details in addition to their influence on the energy consumption
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - design and present your projects e.g. by using it - apply the methodology used in the elaboration of outline proposals (competition proposals) - develop a project from an overall level (client's brief) to a more detailed level (outline proposal) using such tools as analyses, sketching, data retrieval, etc. - assess and design details from an overall perspective - develop a Detail design 1 - elaborate a complete Detail Design 2 project within a specific field (trade)
Content	<ul style="list-style-type: none"> - Registration of existing multi-storey buildings with dwellings and commercial units - Client's brief – specifications: quality, site conditions, supply, building form/ architecture, installations, room requirement, environment - Outline phase: Revit, freehand sketching, SketchUp, coloring, proportions and balance, history of Multi-storey buildings with dwellings and commercial units, building control provisions, analyses, general understanding and presentation - Scheme Design phase: Design techniques and methods such as: Modular design, Computer aided design using Revit, legal requirements, scrutinizing project, layout of constructions and installations, relevant building technique, prefabricated building components, material science (concrete, paint, elastic joints, brickwork, steel/metal, roofs, wood) - Fire technical documentation - Stairs, balconies, wet rooms, roofs, roof terraces and external wall constructions in multi-storey buildings - Analogue and digital tools in sketching and communication of construction (See "BIM – Building Information Modeling" under References)

Source: Created at VIA Built Environment

Subject Box 3: Material Science (BDS/MS)

Duration	1 ECTS-points
Learning aims – Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - the use of the building materials listed below in the construction of state of art multi-storey buildings with dwellings and commercial units - with emphasis on energy efficient, sustainable and industrialized products and components. - such aspects as composition, processing procedures, codes of standards, environmental aspects, protection, commercial availability, aspects related to construction, chemistry etc. in regards to the following materials: <ul style="list-style-type: none"> o Wood o Masonry o Concrete

	<ul style="list-style-type: none"> ○ Steel/metal ○ Roofs (roofing materials) ○ Elastic joints (sealing compounds) ○ Glass
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - analyze, select and fit the building materials mentioned above
Content	<ul style="list-style-type: none"> - Preparation of a building component log/-specifications - Preparation of material specifications on drawings - Preparation of material analyses for a number of chosen materials - Visit at a concrete element factory (stairs and balconies) - Work on selected parts of the specifications in Detail Design II (in accordance with BIPS) - Analogue and digital tools in sketching and communication of construction (See “BIM - Building Information Modeling’ under References)

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	3 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - important structural parts that act as overall stabilizing members in a multi-storey building - all the relevant loads acting on a multi-storey building, including dead load/self-weight, environmental load (snow, wind, thermal and seismic) and imposed loads, including communication in writing and schematic form of the load transfers through the building - analyses and rough calculations or the use of tabled values in relevant constructions, e.g. suspended slabs in storey partitions and roofs, inner leaves, balconies, etc. - internal structural forces in concrete constructions - in-situ cast as well as prefabricated (compression in concrete and tensile forces in reinforcement) - different types of foundation
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - design a multi-storey residential building using known building systems - understand and account for the use of one building system as compared to alternatives and be able to document this in writing and through drawings - analyze and select the most suitable industrially produced load carrying structures, considering sustainability aspects with regard to manufacture and erection; all this based on the structural analysis and design - make cross disciplinary reflections, i.e. the running of vertical and horizontal pathways for installations should be incorporated in consideration to the main structures - understand and use major geotechnical and geological terms - understand and solve problems that concern the joining of balcony elements to ‘the main structure’ - apply appropriate characteristics in relation to statics demands in a BIM model - undertake collision and consistence control on drawing extracts
Content	<ul style="list-style-type: none"> - Building systems - Structural description - Structural analysis - Dimensioning of solid and hollow decks based on tabled information - Geology and soil mechanics - Statics related to balconies, stairways and access balconies - Rules for rough calculation of different types of concrete slabs and beams - Rough calculation of sizes of foundations - Briefing on stability calculation

	<ul style="list-style-type: none"> - Determine loads in your project in accordance with current Eurocodes - Structural documentation A1
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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"> - the most important demands for technical installations and building physics in multi-storey residential buildings - the most important theories and principles applying to heat insulation, sound, moisture and installation pathways in multi-storey residential buildings - and understand the principles for energy frame calculations as well as the flexibility gained by using the energy frame
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - carry out analyses and rough calculations, using relevant computer software within the field of building physics (see below) - make plans for the arrangement of building supplies and services based on analyses and rough calculations
Content	<p>Building services/supplies</p> <ul style="list-style-type: none"> - Supply mains (basic arrangement) - Installation ducts (regulations, demands, arrangement, dimensioning) - Ventilation (demands, analysis, rough calculation) - Sewer, drains, water and heating – rough calculation of sizes - Electricity: High voltage regulations, placement of switches and sockets, etc. - Alternative energy: Solar heating systems, solar cells, soil heating, etc. <p>Building physics</p> <ul style="list-style-type: none"> - Energy Design – analysis of construction form, orientation, solar radiation, e.g. using the program A+E 3D - Energy frame – rough calculations at outline level, using BE10 or Rockwool Energycalculator - Sound theory and analyses c.f. BR-requirements (reverberation, airborne sound and impact sound) - Calculation of reverberation using Ecophon calculationsheet (Excel)

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 boxes.

Subject Box 6: Building Planning and Management (BPM)

Duration	6,5 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - demands for government subsidised housing and general, useful house building - tender procedures and contract forms - with special focus on the contract form used on the semester project: Turnkey contract and relevant contract award conditions - case organization and the parties involved incl. your own (design office) role in a turn-key contact context - the interrelationship between the authorities, the end users, the client, the turnkey contractor and the sub-contractors - the quality assurance of design work, including project scrutiny between design phases, c.f. DANSKE ARK 'Description of Services – Client'

	<ul style="list-style-type: none"> - overall principles for establishing a building site based on demands from PHS - methods for planning, implementation and management of construction works - the options in the BIM model for integration with calculation and management tools
Learning aims – Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - follow up on independent work as well as group work and to use the planning as a basis for the fee calculation and registration of used time - describe and understand your own (the advisor’s) and the main contractor’s organization and conditions with regards to the overall project organization, with respect to the political environment, the authorities, the housing associations and the subcontractors - design multi-storey residential/commercial buildings, within the framework applying to government subsidised housing - carry out calculations, using the ‘successive calculation principle’ in the initial phase of the design work - understand overall project budgeting using parts of the ABC-form applied in government subsidised construction work - take off quantities in the independent project and use the quantities in cost calculation, based on building components in the last phase of the design work - make calculations regarding the overall financial situation, based on overall financial considerations - draft a building site arrangement plan - understand network process diagram planning and carry out an overall network diagram for the construction of a multi-storey residential building, and to transfer the information to a Gantt diagram - manage an plan construction work in the implementation phase
Content	<p>General</p> <ul style="list-style-type: none"> - Project planning - Fee calculation and registration of used time - Government subsidised housing - Successive Calculation and Building Component Calculation incl. taking off quantities - Overall financial situation and overall financial assessment - Network planning/Gantt-diagrams - Building component log - Construction phases and services rendered - Tender procedures and contract forms - Overall building site arrangement - Project scrutiny and quality assurance - Plan for health and safety - Tender documents for sub-contractors <p>Specific for <i>architectural technologists</i></p> <ul style="list-style-type: none"> - Risk assessment of the individual part - Calculation of individual part (architect’s office) - Overall time table, including work processes for individual part <p>Specific for <i>construction managers</i></p> <ul style="list-style-type: none"> - Building site and WPA for own production - Construction time table - Flow chart - Tender calculation and production calculation - Necessary working drawings, including excavation plans, digging profiles and plans for setting out

Source: Created at VIA Built Environment

Subject Box 7: Law (BPM/LAW)

Duration	1.5 ECTS-points
Learning aims	You must gain knowledge about:

- Knowledge	<ul style="list-style-type: none"> - the parties involved in the building activity and their interrelationship - tender procedures and contract forms, including the contract form chosen for the semester project: Turnkey contract - provisions in the Danish Contracts Act, concerning the conclusion of contracts, interpretations, and conditions - basic knowledge about GC93 (Danish: ABT93) - the importance of unambiguous tender documents
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - account for the selected contract form - account for the consequences of the contract form selected in the semester case and the rules applying to the invitation of tenders from sub-contractors - account for the rules governing the tender procedures, the principles behind the tender act, the consequences of the chosen contract form in the semester case, and the consequences of reservation in tender bids - account for the rules governing invitation of tenders from sub-contractors - scrutinise specifications and general conditions in the tender documents, including the consequences of possibly made changes in relation to ABT93 - account for the significance of agreed terms between the turnkey contractor and the client, in relation to agreed conditions between the turnkey contractor and a sub-contractor in respect of terms regarding the period for which the tender will remain open for acceptance, payment and delay - prepare draft agreements for contracts between turnkey contractor and client/scrutinise draft agreement between turnkey contractor and client with focus on payment and delay - prepare letter of invitation (for tender) for sub-contractor as well as draft agreement between turnkey contractor and sub-contractor with special focus on payment and delay - prepare request for provision of security
Content	<ul style="list-style-type: none"> - Provisions in the Danish Contract Act concerning conclusion of contracts - Contract forms - The Danish Tender Act and og EU Directive on Public Tenders - GC92 (Danish: AB92) and GC93 (Danish: ABT93)

Source: Created at VIA Built Environment

2.3.2 Other study elements

During the semester, the Semester team can plan other study elements, e.g. in corporation with the students. This will appear on the time schedule or the schema for each class.

2.4 The Elective programme element

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

Subject Box 8: The Elective programme element

Duration	3.5 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - how reports on building technology constitute part of the working basis within the building trade - how to collect data, and how to analyse and describe a concrete topic within building technology in such a way that it may possibly constitute the basis for further technical elaboration
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - review collected data analytically (using the philosophy of science) in order to illustrate a subject of own choice within building technology, or in order to solve a concrete

	<ul style="list-style-type: none"> - task within building technology - elaborate a report within building technology containing a problem statement, collected data (empirical), analyses, argumentation and conclusion and possibly concrete proposals for a solution
Content	<ul style="list-style-type: none"> - You have to write a report independently and hand it in to your supervisor (see the time schedule)

Source: Created at VIA Built Environment

Subject Box 9: Philosophy of science (PS)

Duration	1.5 ECTS-points
Learning aims - Knowledge	You must gain knowledge about: <ul style="list-style-type: none"> - basic and relevant concepts within philosophy of science
Learning aims - Skills	You must be able to: <ul style="list-style-type: none"> - argue for methods used in data collection, and use such data and be able to reflect upon their relevance in a given context - produce an academic, welwritten report within the genre of philosophy of science
Content	<ul style="list-style-type: none"> - What is Philosophy of Science and in which way is it relevant within the profession (Ar-chitectural Technology and Construction Management)? - Basic scientific concepts - How the writing of a report may be used as a research tool, as argumentation, and for the production of knowledge - The basic scientific model and "pentagonen" - Problem statement - What is a good problem statement? - Research design - considerations concerning the analysis (how to do it) - Methods used for data collection - (production of empirical data) - Systematization and interpretation of data - how? - Writing a report

Source: Created at VIA Built Environment

2.5 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
Project work in relation to 'Multi-storey buildings - with dwellings and commercial units'		X
Registration of existing building with dwellings and commercial units	X	
The elective programme element (report)	X	
Portfolio		X

Source: Created at VIA Built Environment

Find general information about the exam on [Study.net](#).

2.5.1 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 4th semester emphasis is put on you using the knowledge and competencies you have already learned and seeking new knowledge to solve your semester project in a professional and analytical way.

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

2.5.2 Evaluation of the elective programme element

The supervisor will assess and give you feedback in the form of a grade supplemented with an opinion given in a feedback sheet. In addition, a communication tutor may also be assigned to give a qualitative written assessment of the report form (structure, references etc.).

The overall assessment criteria used are:

- Problem statement – relevance and usefulness
- Choice of method and its application
- Professional (theoretical) argumentation
- Conclusion
- Form (Language, style, neatness, clarity, etc.)

The academic content and problem statement; the methodical approach and solution of the problem and formalities count equally with the ratio of 50/50.

In this context, the academic content refers to the complexity / degree of difficulty, whereas methodological reflections refer to the use of relevant methods and valid arguments.

3 THE TEACHING

3.1 Guiding time schedule

The semester team will hand present you for a guiding time schedule at the semesterintroduction.

3.2 References and knowledge base

3.2.1 Cross-disciplinary references

- ICT and BIM
Implementation of BIM at VIA, Campus Horsens
- Byggeskedefonden www.bsf.dk
- BYG-ERFA, byggeteknisk erfaringsformidling www.byg-erfa.dk
- BIPS <http://bips.dk>

3.2.2 Single-subject references

Subject	Reference
Building Design (BDE)	- Materials placed on Study net
Structural Design (STD)	- Materials placed on Study net
Building Services (BSE)	<ul style="list-style-type: none">- BR10 chapters 6, 7 and 8- DS 418 ver 7. - Calculation of buildings heatloss- DS 490 - Sound classification of dwellings- SBi direction 237 – sound insulation between dwellings – new buildings- SBi direction 213 – calculation of buildings energy consumption- The space required to accommodate services,- VIA material – indoor climate and ventilation, JPP; 2011- VIA material – installations in multi-storey buildings, JPP; 2003- Improving airtightness in dwellings, energy saving trust; 2005
Building Planning and Management (BPM)	- Materials placed on Study net