

Get updated
VIA University College



SEMESTER SYLLABUS 1ST SEMESTER PLOT AND HOUSE IN 1-2 STOREYS

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

VIA University College Horsens

Spring 2016

CONTENT

1	THE PROGRAMME	6
1.1	The study environments	6
1.2	Teaching- and workforms	7
1.2.1	Individual learning offers	7
1.3	Study activity / Attendance	8
1.4	Quality-assurance and -development of the programme	8
1.4.1	Your involvement	8
1.4.2	The local DSR (Student Council)	9
<hr/>		
2	THE SEMESTER	10
2.1	Entrance requirements	10
2.2	Study start test	10
2.3	Learning aims for the 1st semester (transcribed from the curriculum)	10
2.4	The project work	11
2.4.1	Single-subject teaching	12
2.4.1.1	Building Design (BDS)	12
2.4.1.2	Structural Design (STD)	14
2.4.1.3	Building Services (BSE)	14
2.4.1.4	Building Planning and Management (BPM)	15
2.4.1.5	Communication (COM)	16
2.4.1.6	Land Surveying and Spatial Planning (SUR)	17
2.4.2	Other study elements	17
2.5	Tests and evaluations	17
2.5.1	Evaluation of the work with the project	18
<hr/>		
3	THE TEACHING	19
3.1	Introductory Assignments	19
3.2	Practical group work	19
3.3	'My house at home'	20
3.4	Drawing techniques	20
3.5	Outline proposal	20
3.6	Scheme Design	21
3.7	Guiding time schedule	22
3.8	References and knowledge base	23
3.8.1	Cross-disciplinary references	23
3.8.2	Single-subject references	23

- **G Alcock - Making a Presentation - 2005 (Studynet)**

24

SEMESTER SYLLABUS

Welcome to the Architectural Technology and Construction Management programme at VIA!

We sincerely hope you are going to enjoy your studies at VIA, whether it is for 2 years, becoming an AP Graduate in Construction Technology or for 3 ½ years becoming a Bachelor of Architectural Technology and Construction Management.

You will get to know a lot of new students and teachers, and you will probably experience that the teaching principles are different from what you are familiar with from previous.

The main learning approach is Problem Based Learning (PBL) based on specific projects - ranging from simple single-family houses to industrially produced buildings and more complex multi-storey buildings as well as refurbishments. You finish the last semester with a dissertation and a bachelor project of your own choice, e.g. in cooperation with a specific company or client.

You will learn how to plan and design a building project, i.e. how to plan and draw, and how to describe and manage the production of building projects as it is done in real life by consultants, building component manufacturers and entrepreneurs in the building industry.

During the course of programme you will learn much more about yourself and your preferred learning style, and you will gain new social, technical and theoretical competencies within different working fields in relation to construction.

Along the way, you may find one field, particularly interesting and you may want to further your qualifications within that specific field. You may achieve this through the elective programme elements on the 4th and the 5th semester where you can specialize. You may also specialize by choosing an internship, final dissertation and bachelor project within your field of interest.

We encourage you to make use of the facilities made available to you in the form of teaching, physical and digital services, and not least, the social opportunities for good teamwork with other students and employees at the college.

Quality assurance and development

Find 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.

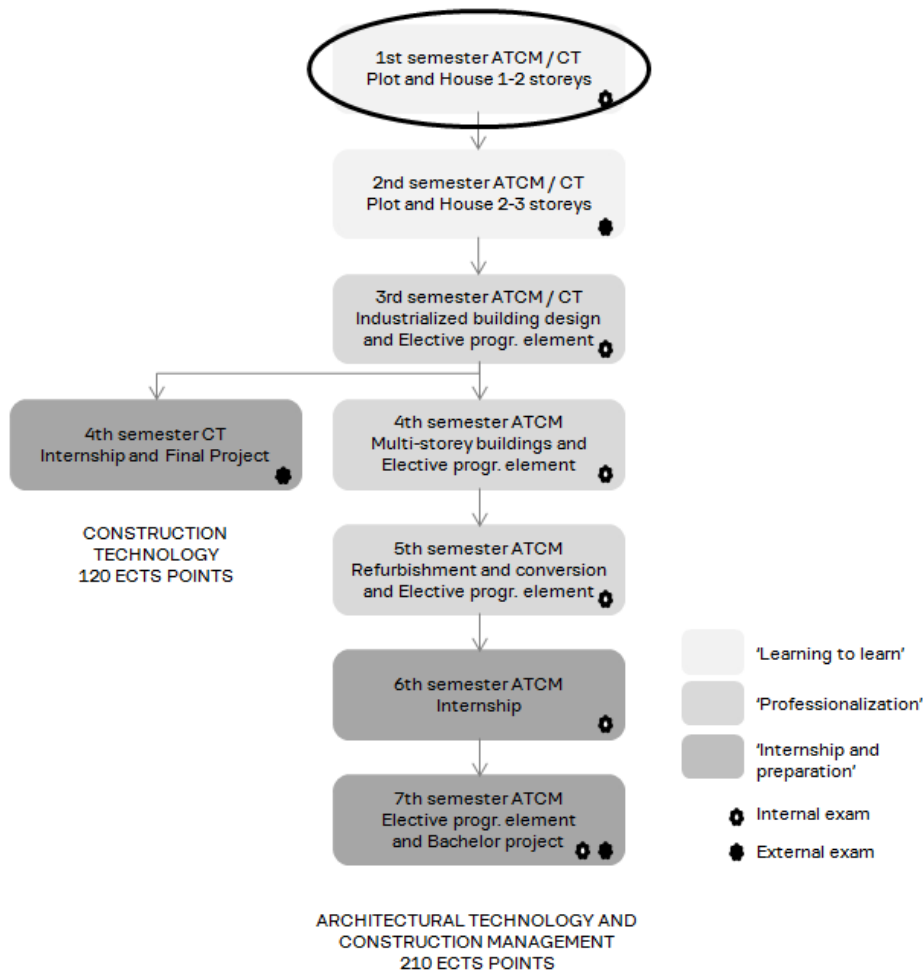
As a student, you have your own 'workplace' at the college, which we encourage you to use. The 'workplace' will change from semester to semester, depending on the size of the classes and your choice of specialization.

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.

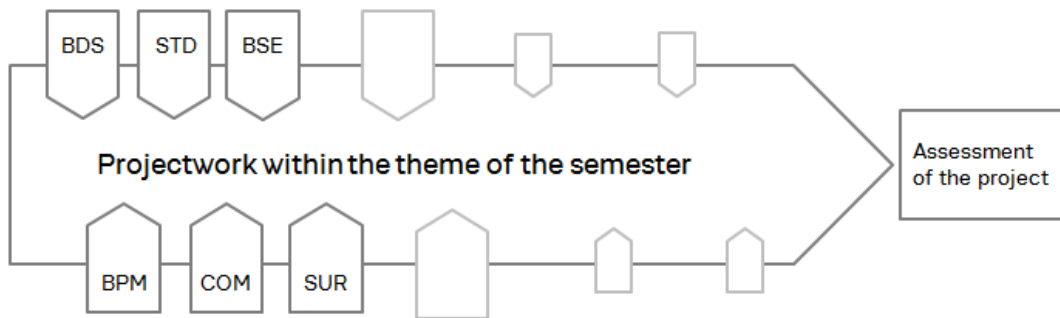
The programme management at VIA Built Environment in Horsens, Aarhus and Holstebro respectively continuously involve the local DSR in a discussion of the work with quality assurance and development of the programme, including:

- 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

2.1 Entrance requirements

In order to be admitted to the 1st semester, you must meet the admission requirements defined in the Danish Ministerial order regarding admission to the Bachelor of Architectural Technology and Construction Management profession bachelor degree program.

2.2 Study start test

To ensure that you as a student is study active and to introduce some tools for ongoing self-reflection in relation to your learning a Study start Test is carried out approximately 6 weeks after the Study start. The test consists of 2 parts: a written questionnaire and a dialogue with one or more of your teachers. Based on the written reply and the dialogue, the teachers assess whether you “have passed” or “have not passed”. If you don’t pass, a new test is carried out after additionally 4 weeks. You only have 2 attempts to pass the Study start test.

2.3 Learning aims for the 1st semester (transcribed from the curriculum)

In this section the learning aims for the compulsory part of the semester (30 ECTS-points) are described. The learning aims are transcribed from [the curriculum](#).

Knowledge

At the end of the 1st semester you should have learned:

- and have the ability to reflect on basic theoretical and technical disciplines and their relevant documentation
- and have the ability to reflect on methods and practice used in planning and management as well as collaborative working and learning
- general mathematical principles that are important within the profession
- and understood common building practices related to the 1.semester project theme

- common methods of communication, tools and standards related to the 1st semester project theme
- about relevant laws and regulations
- how to gather data related to project assignments and local authority applications in addition to the preparation of related documents

Skills

At the end of the 1st semester you should:

- know about the trades, professions and subject disciplines involved in the building sector and have gained insight into the building processes related to the 1st semester project theme
- have the ability to use planning and design methods for a 1-2 storey house as well as methods involved in the planning of the building process
- have gained initial skills in applying methods and tools for the collection and analysis of information relevant to the profession
- have the ability to communicate practical and professionally related problems to those professionally involved in the 1st semester project theme

Competencies

At the end of the 1st semester you should:

- have the ability to prepare relevant construction and documentation materials related to the 1st semester project theme
- understand the interrelation of the various subject disciplines in problems related to the 1st semester project theme
- have the ability to identify what they still need to learn based on the knowledge, skills and competencies acquired during the semester

2.4 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.

During your work with the cross-disciplinary project for the 1st semester you will carry out analyses of building-technical problems and you will produce the documentation needed at a scheme design level for a single-family house in 1-2 storeys.

The project is designed as a BIM model in 2D and 3D.

Outline Proposal

Based on a client's brief you (in groups) will be asked to sketch a proposal for a single-family house in 1-2 storeys. The house should have a size of approximately 160 m² without basement, but possibly with a garage. The house must be designed to fit into a specific plot assigned to the group.

The design work is carried out in 3D and presented on posters for approval by the client.

Supplementary documents and analyses are prepared for presentation through PowerPoint or similar programme.

The groups present results to 'the client' and to each other in class.

Scheme Design

During this phase the groups will further develop an outline proposal up to scheme design level. The individual teams will 'work' with a new plot. The scheme design must document that the house can actually be

constructed within the framework of current laws and regulations. The documentation will be in the form of analyses – certificates- details – plans – sections and elevations.

Detail Design 1 and 2

It is not within the scope of the 1st semester theme to work out final Detail 1 and 2 material, but in order to develop the digital drawing skills, each student will further elaborate a given plan to the level required for 'authority approval' and 'work drawing' for construction.

2.4.1 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)	2 ECTS-points
Structural Design (STD)	Structural Design and Mathematics (STD/MATH)	5 ECTS-points
Building Services (BSE)	Building Services and Building Physics (BSE/BPHY)	2.5 ECTS-points
Building Planning and Management (BPM)	Building Planning and Management (BPM)	2.5 ECTS-points
Communication (COM)	Communication (COM)	5 ECTS-points
Land Surveying and Spatial Planning (SUR)	Land Surveying and Spatial Planning (SUR)	3 ECTS-points
Total duration of the semester:		30 ECTS-points

Source: Created at VIA Built Environment

2.4.1.1 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"> - the subject in general, its methods and practice - the history of styles, building materials and building methods in traditional Danish single-family houses - fundamental architectural guidelines regarding the aesthetic setting
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - design the layout of the single-family house through functional analyses - collect information and perform functional analyses in regards to the subject - achieve an understanding of drawings through sketching, free-hand drawing and 3D mod-

	elling
Content	<ul style="list-style-type: none"> - The overall theme of the semester - the single-family house - The history of the single-family house - Architectural understanding - Tools for planning, analysis and visualization - Development and presentation of your own proposal

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"> - the subject in general, its methods and practice - contemporary building methods and building constructions - functional requirements for building constructions, including knowledge about Energy Efficient Sustainable Building Design and Construction - the legal framework governing the construction of single-family houses that have one or two floors - analogue and digital tools in the design and communication of the building design
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - analyze and select building constructions for your project - achieve an understanding of drawings and constructions through sketching and 3D modelling - plan and develop a building from the 'first idea stage' to a stage where it can be used as a basis for local authority approval - prepare documentation and to communicate information about the designed building using 2D/3D drawings – in writing and orally
Content	<ul style="list-style-type: none"> - Layout of house on the plot - Excavation, foundation and floor structures - External walls and external wall completions - Roofing and roofing completions - Oral, graphic and digital presentations of the above - 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/MSC)

Duration	2 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - the subject in general, its methods and practice - building materials and their incorporation in constructions - building materials in the construction of single-family houses - processing procedures and production of building materials - the lifecycle term in relation to durability, maintenance and sustainability
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - analyze and select building materials at a basic level - substantiate and document the selection of building materials
Content	<ul style="list-style-type: none"> - Preparation of a description of building components (including wood, brickwork, ceramic materials and concrete). - Scientific research within the area of study. - A visit to building material manufacturers and building sites.

Source: Created at VIA Built Environment

2.4.1.2 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	5 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - units and concepts related to basic structural design and mathematics - the structural systems and be able to identify these in a single family house of 1-2 floors - masonry - its bearing capacity, masonry areas and brick lintels in small buildings - structural documentation
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - account for loads from the building/construction components - communicate the structural ways of the loads through the buildings, orally and by using sketching techniques - account for the structural system of a single family house - prepare structural documentation as described in the Eurocodes - use mathematics (C-level) and tabled values when determining 'rough dimensions' of building components
Content	<ul style="list-style-type: none"> - Basic units, density, gravity and specific gravity - Action, reaction, dissolving and joining forces - Position plans, design assumptions and choice of construction - Vertical loads in accordance with current standards - Orientation of wind loads - How loads are transferred to foundations - Load bearing and bracing main system - Supports, anchoring, sheer walls, diaphragms and force transferring joints - Types of supports and loads - Masonry: <ul style="list-style-type: none"> o murbinder o wall areas o brick lintels o pre-stressed beams and wall ties

Source: Created at VIA Built Environment

2.4.1.3 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	2.5 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - different types of supply lines and their location on the plot in relation to the building, the boundary line and requirements for different laying depths - different heating systems used in a single-family house - different types of ventilation used in a single-family house - different types of drainage pipes used inside the building and sewer, rainwater and drain pipes used in the ground (on the plot) and the connection to the main sewer system - various installations for water, heating, electricity and communication
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - arrange a plot and house plan in relation to supply lines and service pipes - perform analyses and estimates for ventilation in accordance with the Building Regulations 2010 - perform analyses and estimates for heating systems - plan technical installations on the basis of analyses and estimates

	<ul style="list-style-type: none"> - calculate U-values of some standard constructions
Content	<p>Supply lines</p> <ul style="list-style-type: none"> - Requirements, materials, laying depths and laying conditions for the following different supply lines: <ul style="list-style-type: none"> o District heating o Natural gas o Electricity o Water o Wastewater o Rainwater o Communication and TV <p>Principles and supply pathways for water, heat, ventilation, communication lines and electrical installations:</p> <ul style="list-style-type: none"> - supply pathways in floors, walls and roof/ceiling. (space conditions) - building Regulations requirements for ventilation - drawing symbols <p>Principles for drain and sewer</p> <ul style="list-style-type: none"> - Calculation of U-values of standard constructions used in the project - U-values of windows

Source: Created at VIA Built Environment

2.4.1.4 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	2.5 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - methods for effective study planning - the planning and management of design work - basic principles used in the planning of implementation - methods for estimating building costs - methods and principles for quality assurance - project organizations and the various parties involved – including, the design phases and forms of contracts - basic principles used for the filing and management of digital documents - the structure and content of a building component log
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - plan the course of the semester logically - illustrate the building process in relation to the theme of this semester with consideration to the various parties involved - apply current planning methods involved when designing a single-family house - communicate the planning and implementation to the various parts involved - analyze the implementation and interdependency of the various building activities involved in the building of a single-family house – using a network diagram and the Gantt-charts - define (take-off) quantities and prepare cost estimates using m2-costs and costs of building components - set up a budget based on rough calculation for the various parties involved – including the client (building owner) - use a filing management system for your project as a group - use a building component log as documentation for all decisions relevant to the project
Content	<ul style="list-style-type: none"> - Study planning (personal planning and group planning) - Industry and Technology - Forms of enterprises

	<ul style="list-style-type: none"> - Time schedule (The Gantt-method and network planning) - Calculation and quantity selection - Specifications/Building Component Log - Quality insurance - Site arrangement - Plan for Safety and Health - Waste management - Production flow and division of labor - Teamwork - Group teamwork and resource management - Tender documents - Transportation logistics
--	--

Source: Created at VIA Built Environment

2.4.1.5 Communication (COM)

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

Subject box 7: Communication (COM)

Duration	5 ECTS-points
Learning aims - Knowledge	<p>You must gain knowledge about:</p> <ul style="list-style-type: none"> - the importance of oral and written communication within the ATCM profession - teamwork and methods of cooperation and collaborative learning - the structure of reports and the significance regarding decision making - the structure of a digital presentation - the learning aims for the 1st semester
Learning aims - Skills	<p>You must be able to:</p> <ul style="list-style-type: none"> - present academic subjects orally and in writing - develop a problem formulation - collect data by using methodological principles - both orally and in writing – reflect upon your own learning, including your collaboration with others - write a report as a documentation of the work and phase - use study techniques relevant to PBL
Content	<p>Collaboration and learning</p> <p>Portfolio - including:</p> <ul style="list-style-type: none"> - Self-reflection (learning aims, self-evaluation and knowledge sharing) - Reflection on subjects (learning aims, self-evaluation and knowledge sharing) - Documentation of learning styles, counselling meetings, team contracts, Project meetings - An introduction to team/group organized work - Incorporate practical elements in group-/team work <p>Study techniques, including:</p> <ul style="list-style-type: none"> - Information retrieval - Reading and note-taking techniques - Mind Map on paper and digitally <p>Communication:</p> <ul style="list-style-type: none"> - Verbal presentation technique - Writing decision and narrative minutes of meetings - Formulating problems - Presentation technique - Writing reports

Source: Created at VIA Built Environment

2.4.1.6 Land Surveying and Spatial Planning (SUR)

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

Subject box 8: Land Surveying and Spatial Planning (SUR)

Duration	3 ECTS-points
Learning aims - Knowledge	You must gain knowledge about: <ul style="list-style-type: none">- the system of the Danish Planning Act- site plans, technical maps and the cadastral map- the Danish systems of coordinates and heights- the cadastral system and land registration- building legislation and building regulations- building position methods
Learning aims - Skills	You must be able to: <ul style="list-style-type: none">- perform a benchmark levelling using a levelling instrument and calculate reduced levels- read and understand local plans and assess whether a specific building complies with the local plan- collect local plans and other documents for a given area- collect, read and understand easements- apply the provisions in the Danish Building Regulations on separation distances and building lines as well as the provisions in the Danish Planning Act on planning zones- plan the layout of a plot in relation to a suitable placement of a building
Content	Land Surveying and Spatial Planning report: <ul style="list-style-type: none">- The provisions in the Danish Building Regulations on separation distances and building lines- The Danish Planning Act- Local plans and the framework provisions of municipal plans- Easements and registration of easements- Levelling and levels- Site plans- Contour plans- Building position methods

Source: Created at VIA Built Environment

2.4.2 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.

2.5 Tests and evaluations

At the end of the semester, an internal 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.

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

Table 3: Study elements and their assessment

Study element	Evaluated before the internal evaluation	Evaluated in the internal evaluation
The work with the project in relation to 'Plot and House in 1-2 storeys'		X
Reports	X	
Portfolio (or similar self-reflection)	X	X
Land Surveying and Spatial Planning report	X	

Source: Created at VIA Built Environment

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

2.5.1 Evaluation of the work with 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 1st semester, greater emphasis is put on learning, study method and working process than on the quality of the technical solutions and the documentation material.

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

3 THE TEACHING

3.1 Introductory Assignments

Aim:

- To help students to get to know each other; develop their community knowledge and value of the diversity in the class; develop social contacts and get used to their new learning environment.
- To help lecturers understand students' backgrounds.
- To help develop an understanding of the difference between being a 'pupil' at school and being a 'student' at profession bachelor degree level.
- To help students learn about the education and get an understanding of the work of a Bachelor of Architectural Technology and Construction Management.
- To help students learn basic sketching and drawing techniques.
- To help students plan and write their Learning Portfolio.
- To help students to learn to use the college's IT (Information Technology) network.

Contents / activities:

- 2 day 'semester start' - to help the students to get acquainted.
- A visit to a building exhibition - after which student groups prepare posters about various building components and materials.
- Individual personal interviews within the first week to form the basis of your learning portfolio.
- 'My House at Home' Sketch and document where you live/cultural background.

Possible activities that could be included:

- A visit to a building product manufacturer.
- Contact with more experienced students – interviews, mentoring etc..
- A visit to a building site.
- Presentation of a 1st semester final project by 2nd semester students.

3.2 Practical group work

Aim

- That you learn to develop and optimise effective team working.
- That you learn to understand and value the diversity in the class and develop a L2L 'community of educational practice'.
- That you understand and practice the concepts "sharing knowledge" ; accountability for your own learning and shared responsibility for shared learning.
- That you learn about the important role facilitation/consultation meetings have in your education - how to prepare for them, document them, and learn from them.

Contents – methods

- Introduction to team working theories and models within a PBL learning environment.
- Practical exercises and profiling tests for inclusion in your Portfolio.
- Cultural diversity in learning values and practice.
- Learning styles.
- Knowledge sharing – documented examples of student portfolios.
- Forming and profiling groups for Outline Proposal

Group syllabus exercise – 'What we have to do in the 1st semester'

- Groups read the 1st semester Syllabus, then analyse, discuss, and prepare a poster that illustrates what they have to do in the 1st semester.
- Each group then presents their poster to the class.

- Each student prepares 1 minute video presentation explaining their own understanding and expectations in relation to 1st semester.

Preparation for facilitator meetings / reflection / self-coaching.

Portfolio: Documentation of group/ team and individual learning profiles should be included in your Portfolio and used in your facilitation meetings.

3.3 'My house at home'

Aim: This assignment is designed to help you:

- develop basic competencies in SketchUp and PowerPoint programs
- develop your presentation skills
- gain deeper insights into the diversity within the class

Contents / activities

- Each student prepares a plan and 'model' – using SketchUp - of their house or flat.
- Each student makes a PowerPoint presentation of their plan, SketchUp model - including any photographs of their family / house - for the rest of the class.
- Professional feedback from the teachers including comments on your presentation skills.

3.4 Drawing techniques

Aim: This assignment is designed to help you:

- learn basic skills in using SketchUp as a professional 3D drawing program
- learn basic isometric drawing techniques so that you can make a quick pencil sketch to visualize various problems - possibly on the basis of a SketchUp model

Contents – activities:

- Basic rules for: Drawing formats, scaling, text and dimensions / measurements on drawings, title box, hatching and line sizes.
- Three-dimensional isometric and axonometric drawings.

Working methods:

- Lectures and individual / group assignments. Duration - 1 week

3.5 Outline proposal

Group work

- Describe your client (it is a family)
Whatever client you describe you are informed that he/she has set up the following demands concerning the house and the materials to be used:
 - o External and internal walls are all brick walls
 - o Roof type is pitched roof clad with roof tiles
 - o Heating system based on natural gas from the grid
 - o The house must be placed in such a way that maximum consideration is given to sun and view(s)
 - o There shall be minimum two parking places for cars on the plot.
- Define the rooms required for your client– try also to compare the listed requirements with some of the houses from the historic overview ('Architecture – history and inspiration') in order to see if the requirements "fit in" with some of the plans presented.
- Make analyses concerning room connections, zoning and room sizes (it will be necessary to study requirements in BR 2010, section 3 on dwellings in particular). Concerning room sizes – try also to

look in "space requirements" and "Architects data". The maximum built up area of your house is 150 m².

- Try to determine the ideal orientation of the plan (in relation to the sun)
- Make sketches of the plan (scale 1:100) you would like to work with during the remaining part of the Outline Proposal (weeks 11-15).

NOTICE: All the above exercises will be carried out as hand sketches and notes on A3 and A4 paper formats (Poster 1).

When the group members have finished these small posters, the group swaps posters with another group (you will receive more information on this procedure later). As a group, it is now your job to determine which proposal you consider will best fulfil the requirements defined in the assignment. Your group actually acts as client –proposing possible changes/improvements. Once you have decided which proposal you have chosen including proposals for improvements, you report back to the "owners" of the proposal who in turn will finish the Outline as a group assignment, i.e. completing analyses with respect to structural stability, services etc.

The group organizes any additional information. In this connection additional information includes sketches, proposals for technical installations (sewer, water, etc.). You should also establish a Project File containing information concerning materials used in your proposed building (could be in the form of manufacturer/supplier information).

Sketches, analyses and other proposals should be mounted on separate sheet of paper – later we will scan them for digital presentation (Power Point).

Once all analyses have been completed, the group makes a new poster (Poster 3) including:

- Different perspectives of your house model (interior and exterior)
- Finished plans with furnished rooms – indicating room sizes (1:100)
- Elevations showing all facades and gables (1:100)
- A cross section through the building (1:100)
- Site plan – orientation, access, distances etc (1:200)
- Time schedule showing design and construction phases
- Estimated total cost (based on average sqm prices)

Analyses and poster will be presented to class by the end of week 15.

3.6 Scheme Design

The finished Outline proposal is the first part of the sketching phase. The Scheme Design is the second part (final part) of the sketching phase. The Scheme Design (once approved by the client) forms the basis for the following Detail Design phases, which include Detail Design I and II, Specifications, Bill's of quantities and any other tender documents.

A typical Scheme Design includes building component drawings, details, sections, isometric details and plans. The drawings are still considered as proposals and analyses, but drawn with high degree of accuracy.

One could say that the Scheme Design has to solve all major problems in the building, to avoid any surprises later on in the designing process.

Furthermore, the client expects to receive proposals for the finish of all internal and external surfaces. He is also entitled to receive an updated cost estimate based on the cost of the construction principles applied as well as the materials chosen. Lastly the client also expects to get an overall time schedule for the construction period.

A proposal for working methodology could be as follows:

- Group and personal project planning - based on an analysis of scheme design activities
- Use copy of section and (possibly) plan from outline proposal and try to circle in the details you need to solve in order to secure the safe construction of a building that meets current require-

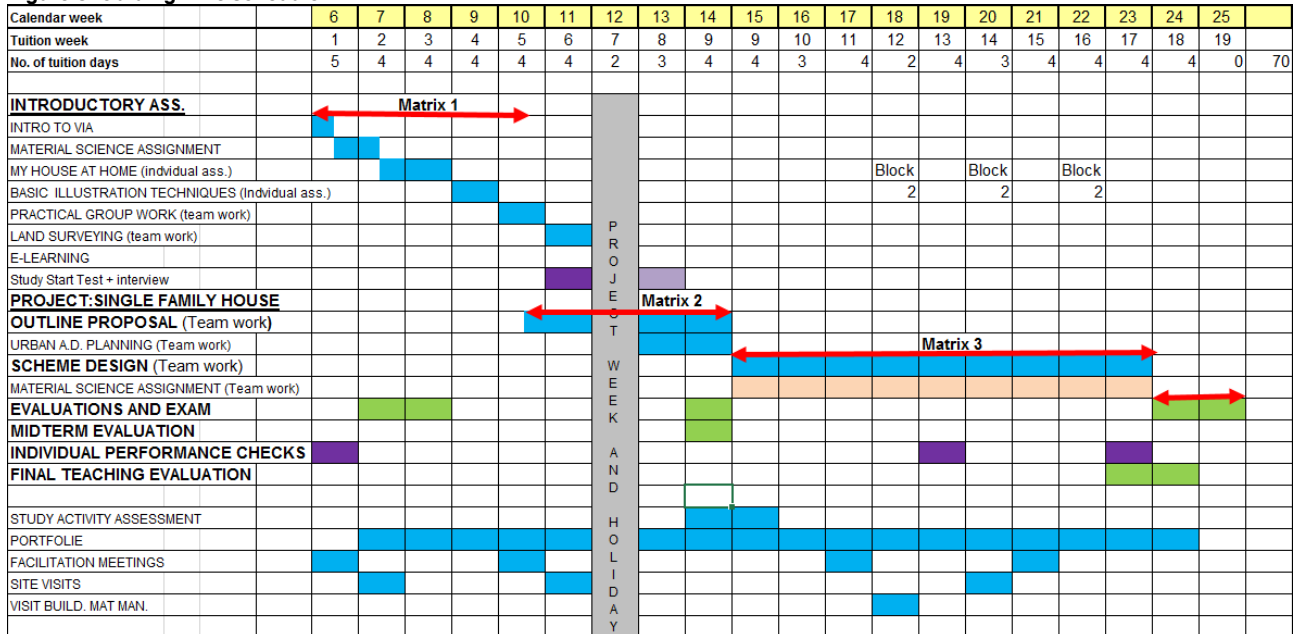
ments in accordance with building regulations, codes and standards (structure, energy consumption, moisture conditions etc.)

- On-going study of building regulations, codes and standards
- Functional requirements of building components (Building component analysis)
- Building component log
- Sketch 3D building component models before making plans and sections (SketchUp)
- The sketched 3D models are used to set up 2D drawings in scale 1:5 – supplied with dimensions and text describing elements and materials used (LayOut)
- Room drawings (kitchen/bath) (Revit)
- Plan scale 1: 50 (Revit model based on SketchUp file)
- Elevations 1:50 (Revit)
- Section scale 1: 20 (Revit and/or SketchUp)
- Site plan 1:200 (Revit or SketchUp)
- Structural analysis (SketchUp or Revit)
- Flow chart of the building process
- Time schedule / Construction planning
- Estimates
- Technical installations – shown on copies from your plan drawings
- Room “scheme”

3.7 Guiding time schedule

To the extent possible, the semester will proceed in accordance with the guiding time schedule presented in Figure 3.

Figure 3: Guiding time schedule



Source: The semester team's creation

3.8 References and knowledge base

3.8.1 Cross-disciplinary references

- ICT and BIM

3.8.2 Single-subject references

(ABDS)

- Danish – English Illustrated Building Dictionary by Ulrik A. Hovmand
- History of the single-family house (Power Point published by Nybolig)
- PowerPoint – presentations (teaching material)

(BDS)

- The Building Regulations 2010 http://www.ebst.dk/file/155699/BR10_ENGLISH.pdf
- SBI 230 Guidelines on the Building Regulations 2010
- SBI 189 Constructions in small dwellings
- SBI Guidelines 233 Protection Against Radon in New Buildings
- Wood 41 - Wooden Floors
- Various handbooks and websites to be recommended by your lecturers for example:
www.digitalconstruction.dk
E-learning (teaching material)
www.students.autodesk.com
www.traecad.dk
Introduction to Revit – Compendium
www.leca.dk www.hhcelcon.dk www.rockwool.dk
www.bib-blokke.dk

(BDS/MSC)

- Mike Riley + Chris Howard: House Construction - ISBN no 0-333-80456-2
- Barry: Introduction to construction of buildings - ISBN no 978-4051-1055-6
- Introduction to Architectural Technology - ISBN no 978 1 78067 294 6
- SBI-Guidelines 189
- SBI-Guidelines 230

(STD)

- The Building Regulations 2010 http://www.ebst.dk/file/155699/BR10_ENGLISH.pdf
- Gitte Normann Bak: Structural Design manual 1.Semester
- SBI 230 Guidelines on the Building Regulations 2010
- SBI 189 Constructions in small dwellings)

(BSE/BPHY)

- BR 2010 (BR 2015)
- Danish Standards (DS 418)
- Sewer and drainage (compendium in Studynet)
- U-values/heat loss (compendium in Studynet)
- 'Space requirements' (compendium on Studynet)
- SBI Guidelines 185 – Sewer installations
- UPONOR VVS Handbook
- UPONOR Technical Handbook
- Ventilation and indoor climate (compendium on Studynet)

(BPM)

- File and document structure – Studynet
- Sfb coding system – Studynet
- E-learning MS-project
- Sigma (V&S Costing books)

(COM)

- G Alcock - Making a Presentation – 2005 (Studynet)
- Honey and Mumford 2006 – Learning styles test (Studynet)
- G Alcock - Writing a Material Science report - 2008 (Studynet)
- G Alcock Writing your Portfolio – 2004 (Studynet)
- Example of 1 semester portfolio
- G Alcock – Learning in a PBL environment 2006 (Studynet)
- Bruce Tuckmann – Developmental sequence in small groups 1965 – adapted by G Alcock 1998 (Studynet)
- Blooms Taxonomy / SOLO approach Structured Observation of Learning Outcomes (John Biggs) - adapted by G Alcock (Studynet)
- Digital portfolio *wix.com*

(COM/IT)

- www.digitalconstruction.dk
- <http://www.bips.dk/Bips/Main/Mainpage.htm>

(SUR)

- Local Plan no. 8, Horsens Municipal, 1984, Translated
- Local Plan no. 141, Horsens Municipal, 2000, Translated
- Building Regulations 2010, the Danish Ministry of Economic and Business Affairs, Danish Enterprise and Construction Authority, Copenhagen 12. of December 2010
- The Planning Act in Denmark, Consolidated Act No. 813 of 21 June 2007, MINISTRY OF THE ENVIRONMENT, October 2007
- The 2006 national planning report – in brief -The new map of Denmark – spatial planning