

SYLLABUS ¹

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty ² / Department ³	Civil Engineering Faculty / Civil constructions and Installations Department
1.3 Chair	—
1.4 Field of study (name/code ⁴)	Civil Engineering / 80
1.5 Study cycle	bachelor
1.6 Study program (name/code/qualification)	Civil Engineering in English / 10 / Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	Building services / DS						
2.2 Coordinator (holder) of course activities	Lecturer PhD. ADAM MARIUS						
2.3 Coordinator (holder) of applied activities ⁶	Lecturer PhD. ADAM MARIUS						
2.4 Year of study ⁷	III	2.5 Semester	6	2.6 Type of evaluation	D	2.7 Type of discipline ⁸	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) ⁹

3.1 Number of fully assisted hours / week	2 of which:	3.2 course	1	3.3 seminar / laboratory / project	1
3.1* Total number of fully assisted hours / semester	28 of which:	3.2* course	14	3.3* seminar / laboratory / project	14
3.4 Number of hours partially assisted / week	of which:	3.5 training		3.6 hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	3.5* training		3.6* hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	1 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.5
		hours of individual study after manual, course support, bibliography and notes			
3.7* Number of hours of unassisted activities / semester	14 of which:	training seminars / laboratories, homework and papers, portfolios and essays			0.5
		additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			
		training seminars / laboratories, homework and papers, portfolios and essays			7
3.8 Total hours / week ¹⁰	3				
3.8* Total hours /semester	42				
3.9 Number of credits	2				

4. Prerequisites (where applicable)

¹ The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.

² The name of the faculty which manages the educational curriculum to which the discipline belongs

³ The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.

⁴ The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.

⁵ Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).

⁶ Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁷ Year of studies in which the discipline is provided in the curriculum.

⁸ Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).

⁹ The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.

¹⁰ The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4.1 Curriculum	<ul style="list-style-type: none"> Physics
4.2 Competencies	<ul style="list-style-type: none"> Sizing building elements in the field 50% Composition of installations in areas 50%

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> Average capacity classroom. Support: laptop, projector, whiteboard
5.2 to conduct practical activities	<ul style="list-style-type: none"> Computer room. Whiteboard

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> Ability to conceive, calculate, design, integrate into buildings and urban areas and run facilities for supply, treatment and evacuation of water, heating and air conditioning
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Design of structural elements in civil engineering, specific to graduated study programme Technological and economical design for the erection, operation and maintenance works in civil engineering, specific to graduated study programme Organization and management of the execution, operation and maintenance procedures for civil, industrial and agricultural constructions Complying to quality and sustainable requirements for civil, industrial and agricultural constructions
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications

7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	<ul style="list-style-type: none"> <i>The objective of this course is to establish an understanding of fundamental concepts in Heat transfer, to teach use of building services for civil engineering practice, to provide students a basis for the courses of Building Services.</i>
7.2 Specific objectives	<ul style="list-style-type: none"> To acquire knowledge of design and dimensioning of the facilities of cold water, hot water, sanitation, electrical installation and ventilation in buildings

8. Content¹¹

8.1 Course	Number of hours	Teaching methods ¹²
Heaters- Thermal comfort and how to influence it through installations, local heating plants, centralized natural circulation and forced circulation systems. Components of a hot water heating and domestic warm water installations	4	Exposure, conversation, explanation, example, demonstration,
Ventilation, heat pumps, air conditioning - Determinants of	4	

¹¹ It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

¹² Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

natural and forced ventilation. Use and parts of the installation, installation of ventilation with hot air. Parts, equipment and ways of doing the installation, installation of air conditioning. The role and composition of the plant.		benchmarking course, presentation slides in powerpoint, course support in electronic format
Water installations – sewer - Water resources and their distribution to consumers; composition of water supply with direct and indirect connection. Drainage installation examples. PSI facilities: fire hydrants, sprinklers, water pulverization, location and composition of the plant.	4	
Electrical installations - Relations for calculating the main phase and three phase currents, composition of plant and parts of an electrical installation phase, installation phase. Installation of lighting and power. Low current installations	2	
Bibliography ¹³ Borza, I. Building services Politehnica Timisoara Publishing House, 1996; 1999		
8.2 Applied activities ¹⁴	Number of hours	Teaching methods
Heating, water- Calculation of heat for heating buildings, heating sizing static bodies, Water supply, sewerage	6	Exposure, conversation, explanation, example, demonstration, benchmarking course, examples of calculation
Ventilation - Calculation of contributions of internal and external heat sources, ventilation air flow calculation, calculation of air networks	6	
Electrics - Sizing electric lighting, sizing the force	2	
Bibliography ¹⁵ Valea, E.S. Heating installations Politehnica Timisoara Publishing House, 2011		

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

¹³ At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.

¹⁴ Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".

¹⁵ At least one title must belong to the discipline team.

- Preparing graduates to pursue master studies in this area and to integrate as engineers in the labor market specific building installations

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Correct answer to the questions from the courses	Written examination	67%
10.5 Applied activities	S:		
	L:		
	P¹⁷: Architectural drawings, slab design notes	Discussions on the plans in the project	28%
	Pr: Attendance	Attendance list	5%
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁸)			
<ul style="list-style-type: none"> • Answers in the written exam must cumulate minimum 5 points out of maximum 10 			

Date of completion

January 22th, 2018

**Head of Department
(signature)**

.....

**Course coordinator
(signature)**

**Date of approval in the Faculty
Council ¹⁹**

12.02.2018

**Coordinator of applied activities
(signature)**

.....

**Dean
(signature)**

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¹⁶ Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

¹⁷ In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.

¹⁸ It will not explain how the promotion mark is awarded.

¹⁹ The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.