

SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Civil Engineering
1.3	Department	Civil Engineering and Management
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Civil Engineering/ Engineer
1.7	Form of education	Full time
1.8	Subject code	13.00

2. Data about the subject

2.1	Subject name				Building Materials						
2.2	Subject area				Civil Engineering						
2.3	Course responsible/lecturer				Associate Professor Ph.D. Eng. Claudiu ACIU claudiu.aciu@ccm.utcluj.ro						
2.4	Teachers in charge of seminars				Associate Professor Ph.D. Eng. Claudiu ACIU claudiu.aciu@ccm.utcluj.ro						
					Lecturer Ph.D. Eng. Elena JUMATE elena.jumate@ccm.utcluj.ro						
2.5	Year of study	I	2.6	Semester	2	2.7	Assessment	Exam	2.8	Subject category	DD/DI

3. Estimated total time

3.1	Number of hours per week	4	3.2	of which, course:	2	3.3	applications:	2
3.4	Total hours in the curriculum	56	3.5	of which, course:	28	3.6	applications:	28
Individual study								hours
Manual, lecture material and notes, bibliography								31
Supplementary study in the library, online and in the field								-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								20
Tutoring								14
Exams and tests								4
Other activities								-
3.7	Total hours of individual study	69						
3.8	Total hours per semester	125						
3.9	Number of credit points	5						

4. Pre-requisites (where appropriate)

4.1	Curriculum	Applied Chemistry
4.2	Competence	Physics; Chemistry

5. Requirements (where appropriate)

5.1	For the course	Class attendance is not mandatory, but it will be a plus for the final grade.
5.2	For the applications	Class attendance is mandatory.

6. Specific competences

Professional competences	<p>After completing the discipline, students must have theoretical knowledge about:</p> <ul style="list-style-type: none"> - natural stone in construction. Building materials made of natural stone; - aggregate for mortar and concrete; - mortars and concretes with inorganic binders; - ceramic materials; - glass materials; - metals (ferrous metals, non-ferrous metals); - wood construction materials; - thermal insulation, sound and hydrofuge insulation; - protection and finishing materials; - use non-destructive methods in order to establish the mechanic characteristics (surface mechanic methods and acoustic methods). <p>After completing the discipline, students will be able to use the following devices: Hydrostatic balance; Screening apparatus; Manual Vicat apparatus; Apparatus for determining the workability of concrete; Automatic vibrating table; Spread table; Palette mixer; Concrete Mixing Machines; Hydraulic press; sclerometer; Betonoscope, Automatic flexural/tension machine.</p>
Cross competences	<ol style="list-style-type: none"> 1. Application of effective and responsible work strategies, punctuality, responsibility and personal liability based on principles, norms and values of professional ethics. 2. Applying the techniques of effective team work on different hierarchical levels. 3. Documentation in Romanian and in a foreign language, for professional and personal development through continuous training and effective adaptation to new technical specifications.

7. Discipline objectives (as results from the key competences gained)

7.1	General objective	Developing expertise in control and quality assurance in support of training.
7.2	Specific objectives	Assimilating theoretical knowledge concerning the characteristics of the main building materials and methods for their determination.

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1.	Stone in construction, stone materials in construction.	Power Point presentation	Video – projector
2.	Aggregates for mortar and concrete.		
3.	Mortars with inorganic binders: definition, classification, determination of the composition of mortars, characteristics of component materials.		
4.	Mortars with inorganic binders: preparation, transport, properties, types of mortar.		
5.	Concretes with inorganic binders: definition, classification, determination of the composition of concrete.		
6.	Concretes with inorganic binders: component materials, structure, technology of concrete.		
7.	Special types of concrete. Concrete products.		
8.	Ceramic materials: generalities, classification, raw material, fabrication technology, ceramic materials used in construction.		

9.	Non-destructive tests of materials: surface mechanical methods, acoustic tests, atomic, electric and combined tests.		
10.	Glass materials: definition, fabrication technology, physical-mechanical characteristics, glass materials used in construction.		
11.	Metals: ferrous metals, non-ferrous metals.		
12.	Wood: wood construction materials.		
13.	Insulation materials, thermal insulation, sound and hydrofuge insulation.		
14.	Polymer materials. Protection and finishing materials.		
Bibliography Claudiu ACIU, Daniela Lucia MANEA (2016). Building Materials. Ed. U.T. PRESS, Cluj-Napoca. ISBN 978–606–737–142–0. Daniela Lucia MANEA, Claudiu ACIU (2015). Materiale de Construcții și Chimie Aplicată. Building Materials and Applied Chemistry. Ed. U.T. PRESS, Cluj-Napoca. ISBN 978–606–737–139–0. Florica PAUL (2008). Civil Engineering Materials – Second Edition. Ed. Matrix Rom, Bucuresti. ISBN 973–973–755–315–7.			
8.2. Applications		Teaching methods	Notes
1.	Work protection and safety technique norms.	Laboratory work presentation and applications	Laboratory works
2.	Tests and determinations on sand.		
3.	Tests and determinations on gravel.		
4.	Determining the granulometric curve of an aggregate and calculation of the optimum aggregate mixture for two sorts.		
5.	Calculation of the optimum aggregate mixture for three and four sorts (successive approximations, graphic and sorts method).		
6.	Determination of mortar composition. Determination of properties of mortar with mineral binders.		
7.	Determination of concrete composition.		
8.	Determination of properties of fresh concrete.		
9.	Determination of properties of ceramic products (wall materials).		
10.	Determination of properties of ceramic products (roofing materials).		
11.	Non-destructive tests using mechanical surface methods.		
12.	Non-destructive tests using ultrasonic methods.		
13.	Determination of mechanical strengths of plaster, cement, mortar, concrete and masonries.		
14.	Final evaluation.		
Bibliography Claudiu ACIU, Daniela Lucia MANEA, Alexandru Gheorghe NETEA (2013). Building Materials and Applied Chemistry – Second Edition. Ed. U.T. PRESS, Cluj-Napoca. ISBN 978–973–662–893–1. Livia Ingrid DIACONU (2013). Chemistry for Civil Engineers. Ed. Societatii Academice “MATEI-TEIU BOTEZ”, Iasi. ISBN 978–606–582–045–6.			

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Acquired skills will be necessary to the employees who work in the quality control of building materials, civil engineers as well as to the teachers in secondary education.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Multiple choice test	Written test	60%
10.5 Applications	Problems	Written test	20%
10.6 Laboratory works	Test of laboratory works	Test after each laboratory work	20%
10.7 Minimum standard of performance			
Mark components: Laboratory (mark L); Problems (mark P); Multiple choice test (mark G).			
Mark computation formula: $N = 0,2L + 0,2P + 0.6G$; is calculated only if: $L \geq 5$, $P \geq 5$ and $G \geq 5$.			

Date of filling in:	Teachers	Title Name	Signature
27.09.2018	Lecturer	Associate Professor Ph.D. Eng. Claudiu ACIU	
	Teachers in charge of application	Associate Professor Ph.D. Eng. Claudiu ACIU	
		Lecturer Ph.D. Eng. Elena JUMATE	

Date of approval in the CEM department <u>20.09.2018</u>	Head of CEM department Associate Prof. Ph.D. Eng. Claudiu ACIU
Date of approval in the Council of the Faculty of Civil Engineering _____	Dean Associate Prof. Ph.D. Eng. Nicolae CHIRA