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	12.00

2. Data about the subject

2.1	Subject name			Building Materials and Applied Chemistry (II)			
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			
2.5 Year of study	I	2.6 Semester	2	2.7 Assessment	Exam	2.8 Subject category	DF/DOB

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					35
Supplementary study in the library, online and in the field					-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays					20
Tutoring					15
Exams and tests					4
Other activities					-

3.7	Total hours of individual study	74
3.8	Total hours per semester	130
3.9	Number of credit points	5

4. Pre-requisites (where appropriate)

4.1	Curriculum	Building Materials and Applied Chemistry (I)
4.2	Competence	Physics; Chemistry

5. Requirements (where appropriate)

5.1	For the course	N/A
5.2	For the applications	N/A

6. Specific competences

Professional competences	After completing the discipline, students must have theoretical knowledge about: - mineral binders (hydraulic and non-hydraulic binders); - mortars with inorganic binders; - concretes with inorganic binders; - ceramic materials; - glass materials; - metals (ferrous metals, non-ferrous metals); - wood construction materials; - bitumen and bituminous binders; - insulation materials, - thermal insulation, sound and hydrofuge insulation; - polymer materials; - protection and finishing materials. After completing the discipline, students will be able to: - determine the properties of binders (plaster, lime, cement); - determine the mortar composition. Determination of properties of mortar with mineral binders; - determine the granulometric curve of an aggregate; - determine the optimum aggregate mixture; - determine of concrete composition. determination of properties of fresh concrete; - determine the properties of ceramic products (wall and roofing materials); - determine the properties of bitumen and bitumen impregnated materials; - determine the mechanical strengths of plaster, cement, mortar, concrete and masonries.
Cross competences	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.	Mineral binders: non-hydraulic binders.	Power Point presentation	Video – projector
2.	Mineral binders: hydraulic binders.		
3.	Mortars with inorganic binders.		
4.	Mortars with inorganic binders.		
5.	Concretes with inorganic binders.		
6.	Concretes with inorganic binders.		

7.	Concretes with inorganic binders.		
8.	Ceramic materials.		
9.	Glass materials.		
10.	Metals: ferrous metals, non-ferrous metals.		
11.	Wood: wood construction materials.		
12.	Bituminous binders. Bitumen.		
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 Construcţii şi 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.	Determination of properties of construction and molding plaster.		
3.	Determination of properties of lime.		
4.	Determination of properties of cement.		
5.	Determination of mortar composition. Determination of properties of mortar with mineral binders.		
6.	Determining the granulometric curve of an aggregate and calculation of the optimum aggregate mixture for two sorts.		
7.	Calculation of the optimum aggregate mixture for three and four sorts (successive approximations, graphic and sorts method).		
8.	Determination of concrete composition.		
9.	Determination of properties of fresh concrete.		
10.	Determination of properties of ceramic products (wall materials).		
11.	Determination of properties of ceramic products (roofing materials).		
12.	Tests and determinations on bitumen and bitumen impregnated materials.		
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
Course	Multiple choice test (60 questions)	Written test (60 minutes)	60%
Applications	Solving 3 problems	Practical exam (40 minutes)	20%
Laboratory works	Test of laboratory works – 5 questions	Test after each laboratory work	20%
10.4 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
15.09.2016

Teachers in charge of seminars
Associate Prof. Ph.D. Eng. Claudiu ACIU

Date of approval in the department
15.09.2016

Head of department
Associate Prof. Ph.D. Eng. Claudiu ACIU