

SYLLABUS ¹

1. Information about the program

1.1 Higher education institution	Politehnica University of Timisoara
1.2 Faculty ² / Department ³	Civil Engineering/ CAICAM 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 – English/10/Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	General Chemistry						
2.2 Coordinator (holder) of course activities	Conf.univ.dr ing. Narcis DUTEANU						
2.3 Coordinator (holder) of applied activities ⁶	Conf.univ.dr ing. Narcis DUTEANU						
2.4 Year of study ⁷	1	2.5 Semester	1	2.6 Type of evaluation	E	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	4 of which:	3.2 course	2	3.3 seminar / laboratory / project	2
3.1* Total number of fully assisted hours / semester	56 of which:	3.2* course	28	3.3* seminar / laboratory / project	28
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	2 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			1
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			
3.7* Number of hours of unassisted activities / semester	28 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			14
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			
3.8 Total hours / week ¹⁰	6				
3.8* Total hours /semester	84				
3.9 Number of credits	5				

4. Prerequisites (where applicable)

4.1 Curriculum	• none
4.2 Competencies	• none

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.

5. Conditions (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> Learning and deepening the knowledge in general chemistry by developing abilities and skills for proper handling of chemicals and equipments used in a laboratory
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Technological and economical design for the erection, operation and maintenance works in civil engineering, specific to graduated study programme 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"> Learning and deepening the knowledge of the basic concepts in general chemistry required for a better understanding of construction materials.
7.2 Specific objectives	<ul style="list-style-type: none"> Developing abilities and skills for proper handling of chemicals and equipments commonly used in a chemical laboratory. Developing analytical thinking and teamwork skills.

8. Content¹¹

8.1 Course	Number of hours	Teaching methods ¹²
Introduction: Space and matter. Substances. International System of Units	1	- interactive teaching, so that students have the opportunity to present their views, to argue and ask questions
Atomic structure of the substances: Atom structure – Rutherford's experiment, atomic models; Atomic number, mass number, chemical element; Electronic configuration of the atoms; Periodic table of the elements	10	
Chemical bonds: Ionic, covalent and metallic bond; Intermolecular forces (van der Waals forces, hydrogen bonds)	3	- use of the Internet as part of the teaching / learning process
Gas laws: Boyle's law, Charles's law, Gay Lussac's law, Dalton's law of partial pressures	2	
Solutions: Thermal effect of dissolving; Concentration of solutions, Solubility; Vapor pressure of solutions; Osmosis and osmotic pressure	4	- team work to develop the students ability to exchange
Chemical reactions: Classification of chemical reactions;	6	

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.).

Endothermic and exothermic reactions; Stoichiometry and stoichiometric calculations		ideas and work together to accomplish the assigned tasks
Chemical equilibrium: The law of mass action; Le Chatelier's principle; Electrolytic dissociation of water	2	
Bibliography ¹³ 1. J.W.Moore, C.L. Stanitski, P.C. Jurs, <i>Chemistry – The molecular Science</i> , 3 rd Edition, Thomson Brooks/Cole, 2008		
2. Duward F. Shriver, Peter Atkins, <i>Inorganic Chemistry</i> , 3 rd Edition, Oxford University Press, 1999.		
3. S.S. Zumdahl, <i>Basic Chemistry</i> , Lexington, Mass. D.C. Heath, 1996.		
8.2 Applied activities ¹⁴	Number of hours	Teaching methods
1. Solutions. Concentration units. Examples and exercises	2	- interactive teaching, so that students have the opportunity to present their views, to argue and ask questions - use of the Internet as part of the teaching / learning process - team work to develop the students ability to exchange ideas and work together to accomplish the assigned tasks
2. Preparation of a 0.1 molar NaOH solution	2	
3. Determination of the NaOH solution concentration by acid-base titration	2	
4. pH measurement of aqueous solutions	2	
5. Determination of total water hardness by EDTA titrimetric method	2	
6. Water softening using ion-exchange resins	2	
7. Determination of water turbidity	2	
8. Aggressiveness of water against concrete	2	
9. Determination of the cetane number and Diesel fuel index	2	
10. Determination of the grease consistency	2	
11. Determination of the viscosity index of lubricating oils	2	
12. Determination of Engler viscosity	2	
13. Corrosion protection of metals. Electrochemical coating of iron with zinc	2	
Bibliography ¹⁵ 1. J.W.Moore, C.L. Stanitski, P.C. Jurs, <i>Chemistry – The molecular Science</i> , 3 rd Edition, Thomson Brooks/Cole, 2008		
2. Duward F. Shriver, Peter Atkins, <i>Inorganic Chemistry</i> , 3 rd Edition, Oxford University Press, 1999.		
3. S.S. Zumdahl, <i>Basic Chemistry</i> , Lexington, Mass. D.C. Heath, 1996.		

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.

•

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Written examination.	Written examination with midterm examination after the first 7 lectures.	66%
10.5 Applied activities	S:		
	L:		34%
	P¹⁷:		
	Pr:		
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"> Written examination with midterm examination after the first 7 lectures. The final record represents 66% of the written examination and 34% of the practical works. Each student must obtain minimum 5 at course and laboratory. 			

Date of completion

**Course coordinator
(signature)**

**Coordinator of applied activities
(signature)**

**Head of Department
(signature)**

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

**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.