

SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	Babeş-Bolyai University
1.2 Faculty	Faculty of Mathematics and Computer Science
1.3 Department	Department of Computer Science
1.4 Field of study	Computers and Information Technology
1.5 Study cycle	Bachelor
1.6 Study programme / Qualification	Information Engineering

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)	Chemistry/Chimie						
2.2 Course coordinator	Senior Lecturer Raluca Septean						
2.3 Seminar coordinator	Senior Lecturer Raluca Septean						
2.4. Year of study	I	2.5 Semester	1	2.6. Type of evaluation	E	2.7 Type of discipline	Compulsory DF
2.8 Code of the discipline	MLE7025						

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	3	Of which: 3.2 course	2	3.3 seminar/laboratory	1 LP
3.4 Total hours in the curriculum	42	Of which: 3.5 course	28	3.6 seminar/laboratory	14
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					8
Additional documentation (in libraries, on electronic platforms, field documentation)					8
Preparation for seminars/labs, homework, papers, portfolios and essays					8
Tutorship					7
Evaluations					2
Other activities:					
3.7 Total individual study hours	33				
3.8 Total hours per semester	75				
3.9 Number of ECTS credits	3				

4. Prerequisites (if necessary)

4.1. curriculum	<ul style="list-style-type: none"> • Not applicable
4.2. competencies	<ul style="list-style-type: none"> • Not applicable

5. Conditions (if necessary)

5.1. for the course	<ul style="list-style-type: none">• Interactive participation will be encouraged• The students will have access to the electronic format of the course support
5.2. for the seminar /lab activities	<ul style="list-style-type: none">• The attendance is mandatory as established by the regulations• Occupational safety regulations must be observed. Laboratory equipment is required.• For a good outcome of the experimental activities, working subgroups of 2 students will be created.• The tasks that the student has to fulfill during the laboratory session are well defined and repeated with the students at the beginning of the activity.• The students have the obligation to prepare the laboratory works, to prepare written reports, having at their disposal the necessary bibliographic material and the laboratory worksheet.

6. Specific competencies acquired

Professional competencies	<p>C1 Operating with the basics of Mathematical, Engineering and Computer Science</p> <p>C1.1 Recognizing and describing specific concepts to calculability, complexity, programming paradigms and modeling of computing and communication systems</p> <p>C1.2 Using specific theories and tools (algorithms, schemes, models, protocols, etc.) for explaining the structure and the functioning of hardware, software and communication systems</p> <p>C1.3 Building models for various components of computing systems</p> <p>C1.4 Formal evaluation of the functional and non-functional characteristics of computing systems</p> <p>C1.5 Providing theoretical background for the characteristics of the designed systems (Operating with basic notions of chemistry;</p> <p>Defining the basic units of chemistry, the main branches and classes of chemical compounds; Establishing basic physical and chemical properties for the main classes of studied compounds, correlated with the program specificity; Carrying out experiments and applying methods of analysis and interpretation of results, in compliance with occupational safety and health standards).</p>
Transversal competencies	<p>CT1 Honorable, responsible, ethical behavior, in the spirit of the law, to ensure the professional reputation.</p> <p>CT2 Identifying, describing and conducting processes in the project management field, undertaking different team roles and clearly and concisely describing own professional results, verbally or in writing.</p>

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	<ul style="list-style-type: none">• Knowledge of fundamental notions related to: matter, body, substance, fundamental laws of chemistry, atomic structure, electronic configuration.• Identifying the main classes of chemical compounds and their
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	properties
7.2 Specific objective of the discipline	<ul style="list-style-type: none"> • Knowledge of basic sizes and units • Determining the type of chemical bonding • Classification of chemical compounds • Knowing the state of aggregation of the matter and the factors that determine it • Establishing the properties of chemical compounds in correlation with their structure

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction. Short history. Matter, body, substance	Lecture, Explanation, Conversation, Problematization	2 hours
2. Simple substances, composed substances. Mixture of substances. Chemical element.	Idem	2 hours
3. The atom. Composition. Electronic shell. Electronic configurations.	Idem	2 hours
4. Classification of chemical elements. Metals. Non-metals. Specific properties.	Idem	2 hours
5. Chemical formula. Types of formulas. Stoichiometry. Concentrations.	Idem	2 hours
6. Chemical Bonding	Idem	2 hours
7. Physical interactions. Polarity. Dipole moment. States of aggregations of matter.	Idem	2 hours
8. Branches of Chemistry. Main classes of chemical compounds.	Idem	2 hours
9. Structure of the solid state. Applications.	Idem	2 hours
10. Inorganic compounds. Oxides, bases, salts, acids.	Idem	2 hours
11. Simple organic compounds.	Idem	2 hours
12. Functionalized organic compounds.	Idem	2 hours
13. Chemical reactions. Types of chemical reactions. Acid-base reactions. Determining the pH.	Idem	2 hours
14. Redox reactions. Applications. Electric cell.	Idem	2 hours
Bibliography		
1. Principles of general chemistry, Martin S. Silberberg, 2013, ISBN 978-0-07-340269-7, Ed. Mc Graw Hill (third edition)		
2. Principles of Chemistry, A Textbook of General Chemistry, Ioan Baldea, Cluj University Press , 2005		
3. Inorganic Chemistry, Gary L. Miessler, Paul J. Fischer, Donald A. Tarr, Editura Pearson, 2014, ISBN-13: 978-0-321-81105-9 (student edition)		
4. Organic Chemistry, J. Clayden, N. Greeves, S. Warren, Editura Oxford University, 2012, ISBN-13:9780192970293.		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. Labor protection in chemical laboratory. Laboratory glassware.	Explanation, Conversation, Problem solving, Exercise	2hours

2. Cooling sources. Heating sources. Weighting.	Idem	2 hours
3. Measuring of volumes. Preparation of solutions.	Idem	2 hours
4. Purification of Chemical compounds. Extractions	Idem	2 hours
5. Purification of Chemical compounds. Recrystallisation. Filtration	Idem	2 hours
6. Purification of Chemical compounds. Distillations	Idem	2 hours
7. Titration. Determining the pH	Idem	2 hours
Bibliography:		
<ol style="list-style-type: none"> Essentials of Chemistry in the Laboratory, second edition, H.W. Frantz, L.E. Malm, H.W. Freeman and Company, San Francisco & London, 1968. Purification of Laboratory Chemicals, W.L.F. Armarego, C. Chai, Elsevier - Health Sciences Division, 2017. 		

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

<ul style="list-style-type: none"> By learning the theoretical-methodological concepts and approaching the practical aspects included in the Chemistry discipline, the students acquire the necessary knowledge, in accordance with the competences and learning outcomes from the Supplement to the diploma and qualifications from ANC.
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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	Acquiring general notions.	Written exam - the access to the exam is conditioned by the presence at the activities carried out in this discipline, in the proportion established by regulation. Exam fraud is punishable by expulsion in accordance with UBB's ECST regulations.	80%
	Correct application of theoretical notions in solving practical problems.		
10.5 Seminar/lab activities	Correctness of the answers - proper acquisition and understanding of the problems treated in the laboratory Proper learning of practical skills.	Failure to perform laboratory / seminar activities leads to the impossibility of taking the exam.	20%
	Laboratory activity		
10.6 Minimum performance standards			
➤ Obtaining a grade of 5 (five) for the exam according to the correcting scale			


Date

10.05.2022

Signature of course coordinator

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Signature of seminar coordinator

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Date of approval

Signature of the head of department

Prof. dr. Laura Dioşan

24.05.2022

A handwritten signature in black ink, appearing to read "Dioşan", is centered below the printed name. The signature is written in a cursive style with a vertical line extending downwards from the end.