

DESCRIPTION OF A STUDY COURSE – SYLLABUS

Title of a course	Chemistry for engineers				
Head of course	PhD Siniša Petrović, College Professor				
Study programme	Professional undergraduate study Occupational Safety				
Status of a course	Obligatory				
Year of study	1.	Semester	I	ECTS credits	7
Teaching plan (L + E + S+ Pr)	L+E				
Goals of a course					
Introduce students to the structure and chemical changes of substances and the basics of chemical calculus. Special attention should be paid to compounds and reactions that may lead to chemical hazards and adverse effects. Exercises develop the ability to solve numerical problems, experiment, record results, and draw conclusions from performed measurements.					
Conditions for enrolling course					
No conditions					
Learning outcomes on a level of a study programme which includes course					
Outcome 1: Explain the basic principles of mathematics, physics, chemistry, electrical engineering and mechanics required for work in the field of occupational safety and health. Outcome 2: Perform and interpret measurements in the field of occupational safety in a laboratory and in the work environment. Outcome 7: Evaluate dangers, damage and effort.					
Expected learning outcomes on a level of a course					
<ol style="list-style-type: none"> 1. Adopt basic chemical terms and solve computational problems. 2. Distinguish types of solutions and carry out measurements in a chemical laboratory. 3. Describe the properties of chemical reactions and their energy effects. 4. Predict potential noxiousness of elements and their inorganic compounds based on their chemical properties. 5. Assess potential noxiousness of organic compounds based on their chemical properties. 6. Describe the properties of complex organic compounds. 					
Content of a course					
Definition of chemistry: and its field of study. Matter and its chemical transitions. Structure of an atom and the periodical system of elements. Chemical laws of bonding related to mass and volume. Characteristics of solid matter, liquid and gaseous substances. The relative atomic and molecular mass and definition of mol as a measure of matter quantity. The chemical bond and structure of molecules. Types of solutions and quantitative definitions of their content. Colloids, electrolytes, acids and bases. Types of chemical reactions. Redox-reactions. The equilibrium, velocity and energetic exchange during chemical reactions. Properties of important elements and compounds and potential hazards in their use. Nuclear reactions. Types and properties of hydrocarbons. Their industrial use and potential hazards. Organic compounds with different functional groups: properties and potential hazards. Lipids and waxes. Carbohydrates, peptides and proteins. Polymer types: reactions of addition and condensation in their formation. Petroleum: chemical content and industrial processing.					
Teaching modes	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> auditory exercises <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> distance learning <input type="checkbox"/> field classes		<input checked="" type="checkbox"/> individual assignments <input type="checkbox"/> multimedia and network <input type="checkbox"/> laboratory <input type="checkbox"/> supervisor's work <input type="checkbox"/> other _____		
Comments					
Students' obligations					

Grading, evaluation and monitoring of students' work continuously during lectures and exams

Grading is based upon evaluation of course's learning outcomes' adoption. Grading is performed continuously during lectures and/or during exam, in compliance with the provisions of Regulation on the assessment of students.

Continuous check-up:

Outcomes	Pre-exam 1 (%)	Pre-exam 2 (%)	Laboratory exercises (%)	Home assignment (%)	Threshold (%)	Max (%)
Outcome 1	18		6	2	13	26
Outcome 2	16		6	2	12	24
Outcome 3	6		2	2	5	10
Outcome 4		10			5	10
Outcome 5		16			8	16
Outcome 6		14			7	14
Percentage of ECTS	2.8	2.8	0.98	0.42		
Total	40	40	14	6	50 %	100 %

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Exam term:

Outcomes	Written exam (%)	Oral exam (%)	Max
Outcome 1	22	4	26
Outcome 2	20	4	24
Outcome 3	8	2	10
Outcome 4	8	2	10
Outcome 5	12	4	16
Outcome 6	10	4	14
Percentage of ECTS	3.2	0.8	
Total	80	20	100 %

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Grading:

A student has passed the exam if he has acquired at least 50% of anticipated credits of a specific learning outcome.

If a student has passed learning outcomes of all courses, the accomplished credits (percentages) of all passed learning outcomes are being added, while the final grade is defined upon following table:

Range of credits (percentages)	Numerical grade	ECTS grade
90,00 – 100,00	Excellent (5)	A
75,00 – 89,99	Very good (4)	B
60,00 – 74,99	Good (3)	C
50,00 – 59,99	Sufficient (2)	D
0,00 – 49,99	Insufficient (1)	F

Obligatory literature

1. Filipović, I., Lipanović, S. Opća i anorganska kemija I i II. Školska knjiga, Zagreb.
2. Biffi: Osnove kemije za studente šumarskog fakultet. Školska knjiga, Zagreb.
3. Sikirica, M. Stehiometrija. Školska knjiga, Zagreb.
4. Amiĉ, D. Organska kemija za studente agronomske struke. Školska knjiga, Zagreb.

Additional literature

