**DESCRIPTION OF A STUDY COURSE – SYLLABUS**

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| **Title of a course** | **Chemistry for engineers** | | | | |
| **Study programme** | **Professional undergraduate study Occupational Safety** | | | | |
| **Status of a course** | Obligatory | | | | |
| **Year of study** | 1. | **Semester** | W | **ECTS credits** | 6 |
| **Teaching plan**  **(L + E + S+ Pr)** | 3+0+2+0 | | | | |
| **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 | | | | | |
| **Expected learning outcomes on a level of a course** | | | | | |
| 1. Usvojiti temeljne kemijske pojmove te rješavati računske zadatke. 2. Razlikovati vrste otopina te provoditi mjerenja u kemijskom laboratoriju. 3. Opisati osobine kemijskih reakcija i njihovih energijskih učinaka te identificirati moguće štetnosti elemenata i njihovih anorganskih spojeva na temelju njihovih kemijskih osobina. 4. Procijeniti moguće štetnosti organskih spojeva na temelju njihovih kemijskih osobina. 5. Adopt basic chemical terms and solve computational problems. 6. Distinguish types of solutions and carry out measurements in a chemical laboratory. 7. Describe the properties of chemical reactions and their energy effects. 8. Predict potential noxiousness of elements and their inorganic compounds based on their chemical properties. 9. Assess potential noxiousness of organic compounds based on their chemical properties.   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. | | | | | |
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