**DESCRIPTION OF A STUDY COURSE – SYLLABUS**

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| **Title of a course** | **Industrial ecology** | | | | |
| **Study programme** | **Specialist professional graduate study Occupational Safety** | | | | |
| **Status of a course** | Obligatory | | | | |
| **Year of study** | 2. | **Semester** | W | **ECTS credits** | 5 |
| **Teaching plan**  **(L + E + S+ Pr)** | 2+1+1+0 | | | | |
| **Goals of a course** | | | | | |
| Introduce students with the concept that requires the industrial system to be viewed as part of the environment with proper care for it. Understand the need to optimize the entire material cycle, from the source material to the finished product and its final disposal. | | | | | |
| **Conditions for enrolling course** | | | | | |
| No conditions | | | | | |
| **Expected learning outcomes on a level of a course** | | | | | |
| 1. Differentiate basic concepts in industrial ecology. 2. Interpret the balance of matter and energy in ecosystems and industrial processes. 3. Critically evaluate the environmental impact of industrial plants. 4. Evaluate the environmental impact of products and services. 5. Analyse the environmental impact of a product and work process. | | | | | |
| **Content of a course** | | | | | |
| *Introduction in industrial technology:* Definition. Historical overview. Industrial and natural ecosystems. Goals. Main circular flows of material, basics of LCA analysis –life circular analysis: analysis of circular flows of material and energy between industrial and natural systems. Circular flow of water. Eco indicators. Comprehensive life cycle of product/process: discovery, excavation, processing, production, transport, distribution, usage, deposit, recycling.  *Management of water resources, fossil fuels and energy:* Water resources, water supply, waste water, reusage of water. Units of energy, global usage of energy, fossil fuel resources, concentration of metal in fuels, classification of fuels, increasing the level of usage.  Recycling, saving, preventing the pollution, sustainable development. Cogeneration, hybrid vehicles, sustainable energy resources. | | | | | |
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