

| STUDY MODULE DESCRIPTION FORM | | |
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| Name of the module/subject Chemistry | | Code 1010604211010710060 |
| Field of study Mechanical Engineering | Profile of study (general academic, practical) general academic | Year /Semester 1 / 1 |
| Elective path/specialty - | Subject offered in: Polish | Course (compulsory, elective) obligatory |
| Cycle of study: First-cycle studies | Form of study (full-time, part-time) part-time | |
| No. of hours Lecture: 9 Classes: - Laboratory: - Project/seminars: - | | No. of credits 1 |
| Status of the course in the study program (Basic, major, other) other | | (university-wide, from another field) university-wide |
| Education areas and fields of science and art technical sciences | | ECTS distribution (number and %) 1 100% |
| Responsible for subject / lecturer: dr hab. Maciej Galiński email: maciej.galinski@put.poznan.pl tel. +48 61 665 2310 Faculty of Chemical Technology ul. Berdychowo 4, 60-965 Poznań | | |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | Basic information on the structure of matter, physical and chemical processes. Basic information on chemistry. |
| 2 | Skills | Description on observed phenomena, drawing the conclusions, analysing of the results. |
| 3 | Social competencies | Ability of the self-learning, analysing and verification. |
| Assumptions and objectives of the course: Reminder basic chemical phenomena, structure of matter. Introduction to electrochemistry, Description of the corrosion processes its mechanism and prevention. Energy storage devices. | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: | | |
| 1. Has a basic knowledge in chemistry, in the construction of the periodic table and properties of the elements, the theory of chemical bonding, organic and inorganic compounds, types of chemical reactions, chemical analysis: - [[K1A_W03]] | | |
| 2. in the extent necessary for an understanding of lectures on metallic and non-metallic materials, environmental protection, fuels and lubricants, building materials and soil, biomechanics and biological materials processed by agricultural and food machinery - [[K1A_W03]] | | |
| Skills: | | |
| 1. Is able to obtain information from the literature, internet, databases and other sources. Can integrate the information to interpret and learn from them, create and justify opinions - [[K1A_U03]] | | |
| 2. Has the ability to self-educate using modern teaching tools such as remote lectures, webpages and databases, educational software, electronic books - [K1A_U06]] | | |
| Social competencies: | | |
| 1. Understands the need and knows the possibilities of lifelong learning - [[K1A_K01]] | | |
| Assessment methods of study outcomes | | |
| Test | | |
| Course description | | |

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| <p>Atomic nucleus composition. Nucleons, nuclides, chemical element, isotope, mol, position in the periodic table, mass number, atomic number, subatomic particles. Natural radioactive decays. Ionizing radiation - properties of radiations. Detection of irradiation - Geigera-Mullera counter. Scintillating Counter ? construction and operations.</p> <p>Types of solution concentrations. Electrolytes. Electrolytic dissociation. Law of Mass Action. Equilibrium constant. Solubility product. Poorly soluble compounds. Conductivity of the electrolytes ? comparison with metals.</p> <p>Temperature dependencies of the conductivities of the electrolytes. Water hardness ? permanent and temporary Limescale. Methods of removing water hardness.</p> <p>Reduction and Oxidation. The concept of half-cell (electrode) in electrochemistry. Primary and secondary cells, standard electrode potentials, - Nernst equation. Current flow through the electrode Potential of the deposition, overpotential.</p> <p>Types and construction of the galvanic cells.</p> <p>Corrosion, Types of corrosion Methods of protecting. Types of the protecting layers. Chemical energy sources. Construction and types of the primary and rechargeable batteries. Description of examples of typical rechargeable batteries. Fuels cells, Supercapacitors, Recycling of energy storage devices principles.</p> <p>Surface phenomena, surface tension, adsorption, wettability.</p> <p>Commercial methods of metal production: sodium, potassium, zinc, aluminum, copper</p> <p>Electrochemical method of metal refinement.</p> | | |
| Basic bibliography: | | |
| Additional bibliography: | | |
| Result of average student's workload | | |
| Activity | Time (working hours) | |
| 1. Participation in lectures | 9 | |
| 2. Preparation to test | 4 | |
| 3. Consultaion | 1 | |
| 4. Participation in test | 1 | |
| Student's workload | | |
| Source of workload | hours | ECTS |
| Total workload | 15 | 1 |
| Contact hours | 11 | 0 |
| Practical activities | 0 | 0 |