

Study programme**Part A) of the study programme *****Learning outcomes**

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| Faculty offering the field of study: | Faculty of Chemistry |
| Field of study: | Chemistry |
| Level of study: | First-cycle studies |
| Level of the Polish Qualification Framework: | Level 6 |
| Profile: | General academic |
| Professional degree awarded to the graduate: | Licencjat |
| Allocation of the field of study within academic or artistic discipline(s), to which learning outcomes for a given field of study refer:: | Disciplines: Chemical Sciences (100 %) Major discipline: Chemical Sciences |
| Symbol | Upon completion the graduate achieves the learning outcomes specified below: |
| KNOWLEDGE | |
| K_W01 | The graduate has advanced knowledge of principles of chemistry and the nomenclature. |
| K_W02 | The graduate knows most important chemical elements and their compounds. The graduate knows ways of correlations between elements' properties and their primary chemical compounds, and the place of the element in the periodic table. |
| K_W03 | The graduate has advanced knowledge of the principles of linear algebra, mathematical analysis and statistics necessary for the description and modelling of chemical phenomena. |
| K_W04 | The graduate knows the role of experiments and computer simulations in chemical processes. |
| K_W05 | The graduate knows basic software packages for the data analysis and elaboration. |
| K_W06 | The graduate knows theoretical and practical aspects of performing quantitative and qualitative analysis by means of conventional and instrumental methods as well as equipment operation rules. |
| K_W07 | The graduate has advanced knowledge of functional groups of organic compounds and reaction mechanisms. |
| K_W08 | The graduate knows states of matter, equations of state, theory of chemical kinetics, intermolecular forces, laws of thermodynamics, phase balance, and fundamentals of electrochemistry. |
| K_W09 | The graduate is familiar with basic concepts, terms, laws and rules of physics and with their universal character to the extent sufficient to continue education. |
| K_W10 | The graduate knows basic concepts and research methods of contemporary inorganic and coordination chemistry. |
| K_W11 | The graduate knows the basics of biochemistry and chemism of metabolic processes. |
| K_W12 | The graduate knows techniques of collecting and preparing samples from environmental matrices for the analysis, water quality indicators, toxicity tests and ways of neutralisation of sewage. |
| K_W13 | The graduate has advanced knowledge of aspects of the construction and methods of assessment of properties of chemical materials and substances. The graduate has knowledge enabling them to use materials for a specified practical purpose and to indicate a method of their management after their lifetime. |

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| K_W14 | The graduate knows and understands theoretical fundamentals of quantum chemistry, postulates of quantum mechanics and their application to the description of atoms and molecules. The graduate knows and understands theoretical fundamentals of various molecular spectroscopies. |
| K_W15 | The graduate has knowledge of chemical technology and engineering. |
| K_W16 | The graduate is aware of occupational health and safety regulations and basic concepts in toxicology. The graduate knows legal regulations pertaining to standards and requirements binding in chemical laboratories as well as legal regulations concerning hazardous substances, their storage and labelling. |
| SKILLS | |
| K_U01 | The graduate is able to use the nomenclature of chemistry and concepts in general chemistry. |
| K_U02 | The graduate is able to correlate properties of chemical elements and their chemical compounds with their place in the periodic table and to correlate chemical properties of substances with their contemporary applications. |
| K_U03 | The graduate is able to apply the methods of linear algebra and mathematical analysis in selected issues in physics and chemistry. |
| K_U04 | The graduate displays the ability to describe and model chemical phenomena and uses selected numerical processes in chemical computations. |
| K_U05 | The graduate is able to perform basic measurements of chemical quantities and is able to elaborate results of physicochemical experiments. |
| K_U06 | The graduate is able to perform quantitative analyses using gravimetric, volumetric and instrumental methods on the basis of analytical procedures. The graduate is able to prepare an analysis-based report. |
| K_U07 | The graduate is able to recognise functional groups of organic compounds and to perform experiments in organic chemistry. |
| K_U08 | The graduate recognises states of matter and is able to define and describe physicochemical processes. |
| K_U09 | The graduate is able to develop simple physical experiments, analyse their results and explain physical phenomena occurring in the surrounding world. The graduate is able to solve basic problems relying on the laws of physics. |
| K_U10 | The graduate is able to synthesise and decompose simple inorganic compounds and selected coordination compounds. |
| K_U11 | The graduate is able to describe the structure and functions of macromolecular compounds occurring in living organisms and to specify metabolic transformations occurring in major metabolic pathways as well as ways of storing and processing chemical energy in the cell. |
| K_U12 | The graduate is able to collect and prepare environmental samples and to analyse them. |
| K_U13 | The graduate is able to find correlations between material behaviour during formation and use, and physicochemical properties, structure and structural type. |
| K_U14 | The graduate is able to use basic quantum numerical methods to describe, in qualitative terms, properties, structures and reactivity of chemical systems. |
| K_U15 | The graduate is able to solve basic problems related to the completion of technological processes. |
| K_U16 | The graduate is able to behave properly while facing a variety of emergencies, such as fire or contact with chemical reagents. |
| K_U17 | The graduate displays language skills in a modern foreign language at the intermediate level (B2 level) in daily life, in education-related situations and while preparing their diploma paper. |
| SOCIAL COMPETENCES | |
| K_K01 | Analytical thinking: The graduate is able to work on his/her own and effectively with large amounts of data, to perceive interrelations between phenomena and draw correct conclusions using the principles of logic. |
| K_K02 | Creativity: The graduate thinks creatively in order to improve existing solutions or develop new ones. |
| K_K03 | Conscientiousness and accuracy: The graduate strives to complete a task as effectively as possible. The graduate is sensitive to details and is systematic. |

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| K_K04 | Communication skills: The graduate is able to communicate the achievements of chemical knowledge to other persons effectively and clearly. The graduate adjusts the level and form of presentations to the needs and capabilities of receivers. |
| K_K05 | Pursuit of development: The graduate is focused on the constant acquisition of new knowledge, skills and experience. The graduate acknowledges the need for constant self-improvement and increasing his/her professional skills. The graduate is aware of the limitations of their knowledge and understands the need for further education. |
| K_K06 | Perseverance and consistency: The graduate works systematically and has a positive attitude to obstacles standing in the way of reaching the desired objectives. The graduate observes deadlines. The graduate understands the need to be systematic in all projects undertaken. |
| K_K07 | Autonomy: The graduate implements agreed objectives on his/her own, taking autonomous and sometimes difficult decisions. The graduate is able to find information in the field literature. |
| K_K08 | Professionalism and ethics: The graduate knows and abides by the standards binding for chemists, including ethical standards. The graduate understands the social role of the profession. The graduate understands and recognises the importance of intellectual honesty and integrity, care of one's health and of the natural environment in activities undertaken by themselves and by other persons. |
| K_K09 | Team work: The graduate is able to establish and maintain long-term and effective collaboration with other persons. The graduate endeavours to achieve the objectives of the team by proper planning and organisation of their own work and the work of other persons. The graduate motivates collaborators to increase their efforts in order to achieve the assumed objectives. |