Załącznik nr 2 do uchwały nr 92 Senatu ZUT z dnia 25 kwietnia 2022 r.

Wydział Technologii i Inżynierii Chemicznej/ Faculty of Chemical Technology and Engineering

Nazwa kierunku studiów/ Programme of studies: chemical engineering

Poziom kształcenia/ Level of qualification: studia drugiego stopnia/ second cycle studies

Profil studiów/ Educational profile: ogólnoakademickim/ general academic

Dziedzina/ Fields of science: nauk inżynieryjno-technicznych/ Engineering and technology

Dyscyplina/ Discipline of science: inżynieria chemiczna/ chemical engineering (100%)

Tytuł zawodowy uzyskiwany przez absolwenta/ Name of qualification (Title conferred): magister inżynier

Opis zakładanych efektów uczenia się/

Description of the planned educational effects

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| --- | --- | --- | --- |
| Kod/ Code | Efekty uczenia się programu studiów/ Learning outcome for programme of studies | Odniesienie do efektów uczenia się dla kwalifikacji na poziomie 6, 7 lub 8 PRK | Odniesienie do efektów uczenia się prowadzących do uzyskania kompetencji inżynierskich |
| Wiedza/ Knowledge |
| ChEn\_2A\_W01 | Graduate has in-depth knowledge in the field of chemical processes, including appropriate selection of materials, raw materials, methods, techniques, equipment and devices for the implementation of chemical and biochemical processes and characterization of the raw materials and products obtained. | P7S\_WG | P7S\_WG |
| ChEn\_2A\_W02 | Graduate has extended and deep knowledge necessary for planning, designing and scaling-up of technological industrial processes as well as planning experiments and elaborating the results of experimental research. | P7S\_WG |   |
| ChEn\_2A\_W03 | Graduate has deep theoretical background related to catalysis and alternative and enhanced techniques in chemical and biochemical processes as well as instrumental analytical methods applied in chemical engineering. | P7S\_WG |   |
| ChEn\_2A\_W04 | Graduate has broadened and deep knowledge about the modern and green chemical and material technologies, including advanced materials and nanomaterials technologies as well as current trends in the development of chemical industrial processes. | P7S\_WG |   |
| ChEn\_2A\_W05 | Graduate has expanded knowledge in the field of environmental protection and sustainable chemical engineering, including environmental risks and dilemmas related to the implementation of industrial chemical processes as well as knows the rules of occupational health and safety. | P7S\_WG P7S\_WK | P7S\_WG |
| ChEn\_2A\_W06 | Graduate has extensive knowledge of entrepreneurship, management, including quality management. | P7S\_WG P7S\_WK | P7S\_WK |
| ChEn\_2A\_W07 | Graduate has established knowledge of legal and ethical conditions of professional activities related to chemical engineering, including the principles of industrial property and copyright protection. | P7S\_WK |   |
| Umiejętności/ Skills |
| ChEn\_2A\_U01 | Graduate is able to utilize the in-depth knowledge in the field of chemical processes, including appropriate selection of materials, raw materials, methods, techniques, equipment and devices for the implementation of chemical and biochemical processes and characterization of the raw materials and products obtained. | P7S\_UW | P7S\_UW |
| ChEn\_2A\_U02 | Graduate is able to use the extended and deep knowledge necessary for planning, designing and scaling-up of technological industrial processes as well as planning experiments and elaborating the results of experimental research. | P7S\_UW |   |
| ChEn\_2A\_U03 | Graduate is able to use broadened and deep knowledge about the modern and green chemical and material technologies as well as current trends in the development of chemical industrial processes. | P7S\_UW | P7S\_UW |
| ChEn\_2A\_U04 | Graduate is able to use expanded knowledge in the field of environmental protection and sustainable chemical engineering, including assessment of environmental risks related to the implementation of industrial chemical processes. | P7S\_UW |   |
| ChEn\_2A\_U05 | Graduate is able to make and verify hypotheses related to simple research problems. | P7S\_UW |   |
| ChEn\_2A\_U06 | Graduate is able to analyse and solve complex problems related to chemical technology and process engineering on the basis of specialist knowledge, bibliographic resources, databases and other sources. | P7S\_UW | P7S\_UW |
| ChEn\_2A\_U07 | Graduate has the ability to acquire and critically evaluate information from bibliographic resources, databases and other sources and to use them in a creative way to interpret and present selected information, opinions and reports. | P7S\_UW |   |
| ChEn\_2A\_U08 | Graduate is able to apply the principles of occupational health and safety in the laboratory. | P7S\_UW |   |
| ChEn\_2A\_U09 | Graduate is able to communicate with specialists and non-specialists using specialized terminology in the field of chemical engineering as well as to conduct a scientific discussion - to present and evaluate various opinions and positions. | P7S\_UK |   |
| ChEn\_2A\_U10 | Graduate is able to communicate in foreign language (English) at B2+ level of Common European Framework of Reference for Languages (CEFR), also in the field of specialized terminology related to chemical engineering. | P7S\_UK |   |
| ChEn\_2A\_U11 | Graduate is able to plan his own work and organize team work, including cooperation with other people, taking a leading role in teams or managing the work of the team. | P7S\_UO |   |
| ChEn\_2A\_U12 | Graduate is able to independently plan and implement his own lifelong learning and to guide others in this area. | P7S\_UU |   |
| Kompetencje społeczne/ Social competences |
| ChEn\_2A\_K01 | Graduate is ready to critical assessment of own knowledge and received information and understands the need for lifelong learning and professional development. | P7S\_KK |   |
| ChEn\_2A\_K02 | Graduate is aware of the importance of knowledge in solving of cognitive and practical problems and is ready to consult experts in the case of difficult problems. | P7S\_KK |   |
| ChEn\_2A\_K03 | Graduate is ready to think and act in an entrepreneurial manner as well as to fulfil social obligations, inspire and organise activities for the social community and initiate actions serving the public interest, including care of the natural environment. | P7S\_KO |   |
| ChEn\_2A\_K04 | Graduate is ready to responsibly perform professional functions, taking into account changing social needs, promote and develop the principles of professional ethics, a culture of quality and cooperation. | P7S\_KR |   |