*Załącznik nr 2 do uchwały Nr 139 Senatu UMK*

*z dnia 29 października 2019 r.*

**Tabela pomocnicza – tabela spójności efektów uczenia się**

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| --- | --- |
| **Wydział prowadzący studia:** | Wydział Nauk Biologicznych i Weterynaryjnych |
| **Kierunek na którym są prowadzone studia:**  *(nazwa kierunku musi być adekwatna do zawartości programu studiów a zwłaszcza do zakładanych efektów uczenia się)* | *Global Change Biology* |
| **Poziom studiów/Poziom Polskiej Ramy Kwalifikacji:**  *(niepotrzebne usuń)* | *studia drugiego stopnia /poziom 7* |
| **Profil studiów:**  *(ogólnoakademicki lub praktyczny)* | *ogólnoakademicki* |
| **Tytuł zawodowy uzyskiwany przez absolwenta:** | **magister** |

|  |  |  |
| --- | --- | --- |
| **Kod składnika opisu Polskiej Ramy Kwalifikacji – charakterystyki szczegółowe P6S/P7S\*** | **Kierunkowe efekty uczenia się**  **(symbol i opis)** | **Nazwa przedmiotu  z programu studiów** |
| **Wiedza** | | |
| *P7S\_WG* | **K\_W01** To provide in-depth and up-to-date knowledge of biophysics and biochemistry | Animal and Plant Ecophysiology, Applied Ecophysiology, Genetics and Evolution, , Thesis Lab |
| *P7S\_WG* | **K\_W02** To explain the biological concepts and relationships between natural phenomena and processes, as well as relationships between structure and function | Animal and Plant Ecophysiology, Applied Ecophysiology, Advanced techniques in environmental data analysis, Ecology of Populations and Communities, Genetics and Evolution, Ecosystem Functioning, Socioeconomic aspects of global change, Environmental impacts of genetically modified organisms, Applied ecosystem services, The future of land use, The last of the wild: European protected areas, Thesis Lab |
| *P7S\_WG* | **K\_W03** To outline the appropriate physicochemical methods of organisms and biological processes | Animal and Plant Ecophysiology, Applied Ecophysiology, , Thesis Lab |
| *P7S\_WG* | **K\_W04** And provide an understanding of the complex phenomena involving organisms and their communities | Animal and Plant Ecophysiology, Dynamic biogeography, Ecology of Populations and Communities, Environmental impacts of genetically modified organisms, Socioeconomic aspects of global change, Case studies in global change, Thesis Lab |
| *P7S\_WG* | **K\_W05** To characterize the unity and diversity of the structure and functioning of organisms | Dynamic biogeography, Socioeconomic aspects of global change, Applied ecosystem services, The future of land use, The last of the wild: European protected areas, Thesis Lab |
| *P7S\_WG* | **K\_W06** To supply an understanding of the impact of organisms on their environment | Animal and Plant Ecophysiology, Applied Ecophysiology, Dynamic biogeography, Ecology of Populations and Communities, Genetics and Evolution, Environmental impacts of genetically modified organisms, Advanced techniques in environmental data analysis, Case studies in global change, Thesis Lab |
| *P7S\_WK* | **K\_W07** To provide in-depth knowledge of the impact of the environment on human health | Dynamic biogeography, Ecology of Populations and Communities, Ecosystem Functioning, Socioeconomic aspects of global change, Environmental impacts of genetically modified organisms, Applied ecosystem services, European legal regulations in environmental protection, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_WG* | **K\_W08** To supply an in-depth knowledge of statistics and specialized IT tools appropriate for describing and forecasting the course of natural phenomena | Applied statistics and spatial analysis in GIS, Multivariate analysis, Biostatistics, Applied ecosystem services, The future of land use, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_WG* | **K\_W09** Together with the methodologies required for qualitative and quantitative investigation of the biological sciences | Animal and Plant Ecophysiology, Multivariate analysis, Biostatistics, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_WG* | **K\_W10** To develop a knowledge of the molecular biology of biological production | Genetics and Evolution, Environmental impacts of genetically modified organisms |
| *P7S\_WG* | **K\_W11** To supply up-to-date knowledge of biological research (biochemistry, genetics, microbiology and physiology) | Animal and Plant Ecophysiology, Applied Ecophysiology, Genetics and Evolution, Environmental impacts of genetically modified organisms, Thesis Lab |
| *P7S\_WG* | **K\_W12** To familiarize the student with specialized computer software packages (word processors, databases, spreadsheets, numerical libraries) | Applied statistics and spatial analysis in GIS, Thesis Lab |
| *P7S\_WK* | **K\_W13** To supply an understanding of the basic concept and principles of copyright and patent law | Socioeconomic aspects of global change, Applied ecosystem services, Thesis Lab, Thesis of Specialization |
| *P7S\_WK* | **K\_W14** And the rules of ethics | Socioeconomic aspects of global change, The last of the wild: European protected areas, Thesis Lab, Thesis of Specialization |
| *P7S\_WK* | **K\_W15** To outline current problems in the field of biology | Animal and Plant Ecophysiology, Applied Ecophysiology, Socioeconomic aspects of global change, The last of the wild: European protected areas, European legal regulations in environmental protection, Thesis Lab, Thesis of Specialization |
| *P7S\_WK* | **K\_W16** To provide a thorough knowledge of the professional literature in the field including areas of specialization | Animal and Plant Ecophysiology, Genetics and Evolution, Dynamic biogeography, Ecology of Populations and Communities, Socioeconomic aspects of global change, The future of land use, Case studies in global change, Thesis Lab, Thesis of Specialization |
| *P7S\_WK* | **K\_W17** And define the basic principles of occupational health and safety and ergonomics | Thesis Lab, Thesis of Specialization |
| *P7S\_WK* | **K\_W18** To set out the principles for creating and developing a form of individual entrepreneurship based on biological knowledge. | Thesis Lab, Thesis of Specialization |
| **Umiejętności** | | |
| *P7S\_UW* | **K\_U01** A thorough knowledge of the use of statistics for describing biological phenomena | Applied statistics and spatial analysis in GIS, Multivariate analysis, Biostatistics, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_UW* | **K\_U02** A knowledge of biochemistry, microbiology, molecular biology and physiology in the analysis of natural processes. | Animal and Plant Ecophysiology, Applied Ecophysiology, Environmental impacts of genetically modified organisms, Thesis Lab |
| *P7S\_UW* | **K\_U03** And facility with advanced measurement and analytical techniques used in biological research | Animal and Plant Ecophysiology, Applied Ecophysiology, Thesis Lab, Thesis of Specialization |
| *P7S\_UW* | **K\_U04** Computer literacy necessary to retrieve information, communicate, organize and analyse data, prepare reports and present results | Dynamic biogeography, The future of land use, Applied statistics and spatial analysis in GIS, Applied ecosystem services, Advanced techniques in environmental data analysis, Thesis Lab, |
| *P7S\_UW* | **K\_U05** An ability to correctly assess threats to human health and life | Ecology of Populations and Communities, Socioeconomic aspects of global change, Environmental impacts of genetically modified organisms, Applied ecosystem services, Advanced techniques in environmental data analysis, |
| *P7S\_UW* | **K\_U06** A familiarity with qualitative and quantitative methods for assessing the state of a population of plant and animal species and biological material | The last of the wild: European protected areas, Ecology of Populations and Communities, Thesis Lab, |
| *P7S\_UW* | **K\_U07** An ability to develop scientific hypotheses based on logical reasoning | Applied Ecophysiology, Socioeconomic aspects of global change,  Applied statistics and spatial analysis in GIS, European legal regulations in environmental protection, Applied ecosystem services, Advanced techniques in environmental data analysis, Thesis Lab, |
| *P7S\_UW* | **K\_U08** Based on measurements aimed at interpreting observations: production of results upon which to arrive at conclusions. | Animal and Plant Ecophysiology, Dynamic biogeography, Ecology of Populations and Communities, Ecosystem Functioning, The last of the wild: European protected areas, Advanced techniques in environmental data analysis |
| *P7S\_UK* | **K\_U09** Using English source information, an ability to perform analyses, summarise and critically assess data, allowing formulation of correct conclusions | Applied Ecophysiology, Genetics and Evolution, Dynamic biogeography, Ecology of Populations and Communities, Socioeconomic aspects of global change, The future of land use, Applied ecosystem services, European legal regulations in environmental protection, Advanced techniques in environmental data analysis, |
| *P7S\_UW* | **K\_U10** An ability to make observations and take measurements in the field and / or laboratory in the presence of a tutor | Animal and Plant Ecophysiology, Dynamic biogeography, Ecology of Populations and Communities, Ecosystem Functioning, Thesis of Specialization |
| *P7S\_UK* | **K\_U11** Demonstrate an ability to read and understand professional literature in the mother tongue and in English | Animal and Plant Ecophysiology, Ecology of Populations and Communities, Dynamic biogeography, The last of the wild: European protected areas, Case studies in global change, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_UK* | **K\_U12** Use of a foreign language enabling basic communication in the field of biological sciences in accordance with the requirements of B2 + CEFR | Genetics and Evolution, Ecology of Populations and Communities, Ecosystem Functioning, Multivariate analysis, Biostatistics, Socioeconomic aspects of global change, Thesis Lab, Thesis of Specialization |
| *P7S\_UO* | **K\_U13** Application of the rules of ethics when working as a leader or as part of a team. | Applied ecosystem services, The future of land use, The last of the wild: European protected areas, Thesis of Specialization |
| *P7S\_UK* | **K\_U14** An ability to present the results orally in English, as well in the writing of scientific reports | Genetics and Evolution, Dynamic biogeography, Ecology of Populations and Communities, Socioeconomic aspects of global change, Applied ecosystem services, The future of land use, Multivariate analysis, Biostatistics, Advanced techniques in environmental data analysis, Case studies in global change, Thesis Lab, Thesis of Specialization |
| *P7S\_UK* | **K\_U15** Use of scientific language to a standard that enables the documentation and development of research results | Socioeconomic aspects of global change, Applied ecosystem services, The future of land use, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_UU* | **K\_U16** Demonstrate an ability to choose a specialization and plan a professional career | Socioeconomic aspects of global change, Applied ecosystem services, The future of land use, Thesis Lab, Thesis of Specialization |
| **Kompetencje społeczne** | | |
| *P7S\_KK* | **K\_K01** An understanding of the need to constantly expand knowledge with the use of scientific and popular science magazines | Animal and Plant Ecophysiology, Applied Ecophysiology, Genetics and Evolution, Dynamic biogeography, Socioeconomic aspects of global change, Applied ecosystem services, The future of land use, European legal regulations in environmental protection, Advanced techniques in environmental data analysis, Thesis Lab, Thesis of Specialization |
| *P7S\_KK* | **K\_K02** An ability to keep abreast of professional developments in the field of natural sciences together with an ability to inspire and organize the learning processes in others | Ecosystem Functioning, Environmental impacts of genetically modified organisms, Advanced techniques in environmental data analysis, Applied ecosystem services, The future of land use, Thesis Lab, Thesis of Specialization |
| *P7S\_KO* | **K\_K03** Develop a rational and critical approach to information obtained from scientific literature, the Internet, and other mass media, as well as popular beliefs relating to biological sciences | Applied Ecophysiology, Genetics and Evolution, Dynamic biogeography, Ecology of Populations and Communities, Ecosystem Functioning, Socioeconomic aspects of global change, Environmental impacts of genetically modified organisms, Applied ecosystem services, The future of land use, European legal regulations in environmental protection, Advanced techniques in environmental data analysis, The last of the wild: European protected areas, Case studies in global change, Thesis Lab |
| *P7S\_KR* | **K\_K04** Remain aware of the responsibility for the reliability of analyzes and expert opinions | Dynamic biogeography, The future of land use, Advanced techniques in environmental data analysis, Thesis Lab |
| *P7S\_KR* | **K\_K05** And aware of the need to follow the rules of ethics | Applied Ecophysiology, Environmental impacts of genetically modified organisms, Applied ecosystem services,  Advanced techniques in environmental data analysis, The last of the wild: European protected areas, Thesis Lab |
| *P7S\_KR* | **K\_K06** Keep a critical eye on working results | Applied Ecophysiology, Dynamic biogeography, Ecology of Populations and Communities, Socioeconomic aspects of global change, Case studies in global change, Thesis Lab, Thesis of Specialization |
| *P7S\_KO* | **K\_K07** Be eager to popularize biological knowledge | Animal and Plant Ecophysiology, Ecology of Populations and Communities, Applied ecosystem services, Environmental impacts of genetically modified organisms, The future of land use, The last of the wild: European protected areas, Thesis Lab |
| *P7S\_KK* | **K\_K08** Remain aware of the need to use mathematical, statistical and IT methods to develop and present the results and analyses | Multivariate analysis, Biostatistics, Advanced techniques in environmental data analysis, Applied statistics and spatial analysis in GIS, |
| *P7S\_KR* | **K\_K09** Be responsible for the safety of your own and others' work, with appropriate risk assessment and aware of the necessity for creating safe working conditions | Animal and Plant Ecophysiology, Ecology of Populations and Communities, Thesis Lab, Thesis of Specialization |
| *P7S\_KR* | **K\_K10** Be responsible for equipment used during research | Ecosystem Functioning, Applied statistics and spatial analysis in GIS, Thesis of Specialization |
| *P7S\_KO* | **K\_K11** Capable of teamwork | Dynamic biogeography, Ecology of Populations and Communities, Ecosystem Functioning, Applied ecosystem services, Multivariate analysis, Socioeconomic aspects of global change, Biostatistics, Advanced techniques in environmental data analysis, The future of land use, Thesis of Specialization |
| *P7S\_KR* | **K\_K12** And aware of the importance of taking the initiative | The future of land use, Advanced techniques in environmental data analysis, Thesis of Specialization |

**\*** zgodnie z rozporządzeniem Ministra Nauki i Szkolnictwa Wyższego z dnia 14 listopada 2018 r. w sprawie charakterystyk drugiego stopnia efektów uczenia się dla kwalifikacji na poziomach 6–8 Polskiej Ramy Kwalifikacji (Dz. U. z 2018 r., poz. 2218).

W przypadku studiów umożliwiających uzyskanie kompetencji inżynierskich należy wprowadzić na końcu przedrostek \_Inż. np.: P6S\_WG\_Inż, P6S\_WK\_Inż, P6S\_UW\_Inż.

Cztery składniki opisu efektów (bez wskazania profilu kształcenia – co wynika z opisu kierunku):

* poziom (P6S, P7S)
* składnik (WG, WK, UW, UK, UO, UU, KK, KO, KR),
* numer charakterystyki (1,2,3...)