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Course title: ECOLOGY

ECTS credit allocation (and other scores): 5

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English

Number of hours per semester: 60

Course coordinator/ Department and e-mail: Jacek J. Nowakowski, Department of Ecology and Environmental Protection; jacek.nowakowski@uwm.edu.pl

Type of classes: classes and lectures

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#### Substantive content

CLASSES: Environmental microclimate and adaptations to habitat conditions. Methods of sampling water and soil to ecological research. General population and sample - methods of sampling: analysis of the occurrence of organisms. Methods for examining population density. Population dynamics models. Analysis of population reproduction and mortality. Age structure of the population. Community - trophic organization.

LECTURES: Ecology as a scientific discipline. Ecological systems. Global ecology - determinants of life on Earth. Ecological factors and adaptation of organisms to environmental conditions. Temperature distribution in the environment: distribution of organisms, thermoregulatory mechanisms of poikilothermic and homoeothermic organisms, heterothermy. Adaptations of organisms to lighting conditions. Water in the environment. Atmospheric gases and edaphic factors. Energy management of organisms. Population as a time-space ecological system. Population dynamics models - number regulation. Population invasions. The ecological structure of the population. Interpopulation competition. Structure and organization of community. Interspecies relationships and the biotic biodiversity. Evolutionary aspects of interspecific competition. The structure and functional processes of the ecosystem. Homeostasis and dynamics of the ecosystems. Biogeochemical cycles. Landscape ecology)

Learning purpose: Understanding the complexity of the nature on different level of ecological systems and structure and function of the natural environment. Knowledge of ecology issues and research methods as a scientific discipline. Shaping ecological awareness.

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On completion of the study programme the graduate will gain:

Knowledge: W1 - knows the structure and aspects of the functioning of ecological systems at various levels of organization; W2 - knows the adaptation of organisms to different environmental conditions; W3 - knows the problems and research methods in ecology.

Skills: U1 - explains the structure and functioning of ecological systems at various levels of organization; U2 - uses mathematical and graphic models to describe the structure and function of ecological systems; U3 - applies research methods and uses equipment for ecological research; U4 - plans and conducts experiments in laboratory and field conditions in the field of ecology.

Social Competencies: (K1 - is aware of the complexity of the living world at various levels of organization and dependence of the functioning of organisms and environmental factors; K2 - shows readiness to analyze ecological connections and the effects of human interference in the natural environment; K4 - has a shaped ecological awareness.



Basic literature:

- 1) Krebs. Ch., Ecology. The Experimental Analysis of Distribution and Abundance, University of British Columbia, Vancouver, 2009 ;
- 2) Krebs. Ch., Why Ecology Matters, University of Chicago Press, Chicago, 2016 ;
- 3) Krebs, C.J. , Ecological Methodology, Addison-Wesley Educational Publishers, Inc., 1999.

Supplementary literature:

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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: exercises – 30 h., lecture – 30 h., consultation – 2 h.

Student's independent work: analysis of data and preparing the reports; theoretical preparation for classes, theoretical preparation for colloquium and exam – 63 h.