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Course title: BIOLOGY

ECTS credit allocation (and other scores): 6

Semester: autumn

Level of study: ISCED-7- long-cycle programmes (EQF-7)

Branch of science: Agricultural sciences

Language: English

Number of hours per semester: 60

Course coordinator/Department and e-mail: Mirosław Michalski, Department of Parasitology and Invasive Diseases,  
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Type of classes: classes and lectures

#### Substantive content

**CLASSES:** Structure of eukaryotic and prokaryotic cells, comparison of plant and animal cells. Structure of plant and animal tissues, plant morphology. Interspecies of plant compounds. The nutritional value of plants and the adaptation of animals to digest plant food. The importance of unicellular organisms in medicine. Plant active substances, medicinal plants, honey and poisonous plants. Rules for harvesting, extraction, storage and use of plant substances. Herbs and examples of veterinary medicines based on vegetable raw materials. Evolutionary development of locomotor organs in invertebrates. GMO - methods and goals of modification as well as benefits and fears for nature and man. Comparative anatomy of invertebrates and vertebrates and adaptation to environmental conditions and lifestyle. New and exotic patients in the veterinarian's office.

**LECTURES:** The levels of organization of living matter, the basics of organisms, biological nomenclature, structure and basic functions of a eukaryotic cell. Features of life and unity of the living world. Radiobiology of plant and animal cells. Modern development of herbal medicine, natural active substances, natural poisons and poisoning. Biomimetics and "hidden" control of host behavior. Evolution pathways of sense organs, evolutionary development of the digestive system, masters of reproduction and evolutionary variability of arthropod structure. Mycorrhiza, stimuli and signals in plants, pheromones, apoptosis. Biodiversity of the organic world - plants and animals. Rules of survival in the animal world, food chains, the phenomenon of hormones. Homeostasis in individual development as well as hormonal and neural control mechanisms. Variability and adaptation of biological agents in states with reduced immunity. The use of biological agents in bioterrorism.

**Learning purpose:** Description and interpretation of basic phenomena and processes occurring in animate nature. Equalization and extension of biological knowledge, especially in the field of the concept of the organism, life functions and evolution of the organic world. Structure of various structures of animal organisms in relation to their function. Understanding the relationship between structure and function at the cell and tissue level. Acquiring basic information about the course of selected physiological processes occurring in plants in connection with their structure and appropriate adaptations and modifications.

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On completion of the study programme the graduate will gain:

**Knowledge:** General and basic information about the structure of the cell, levels of life organization (cell-free forms, cells, tissues and organs), structure and physiology of prokaryotic and eukaryotic organisms, single- and multi-



cellular organisms, relationships between organisms - the network of life. Phylogenetic and ontogenetic development. Elements of medical botany. Characteristics of the most important plant and animal kingdom clusters.

**Skills:** Equipping the student with knowledge in the field of plant cell biology with particular emphasis on organelles and pharmacopoeial plant structures, as well as the structure and function of plant tissues and organs. Using knowledge of the structure and function of animal tissues and basic biological processes occurring in the animal world. Developing habits of independent cause-and-effect thinking, the ability to analyze the transferred knowledge and effective use of literature sources, including the Internet. Anatomical and morphological observations using optical microscopes on live and fixed specimens.

**Social Competencies:** Understanding biological laws relating to the phylogenetic and ontogenetic development of individual animal organism structures, linking biological laws with the structure and function of mammals. Developing students' skills in recognizing medicinal and poisonous plant species based on fresh and herbarium specimens. Ability to use active chemical compounds as medicines. Estimation and prediction of the effects of natural poisonous substances. Application of acquired knowledge in professional career.

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**Basic literature:** 1. B.Alberts, D. Bray, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walters, 1999, Podstawy biologii komórki, PWN, W-wa 2. W. Kilarski, 2003, Strukturalne podstawy biologii komórki, PWN, W-wa 3. Z. Kawecki, 1982, Zoologia stosowana, PWN, W-wa 4. Cz. Jura, 2005, Bezkręgowce. Podstawy morfologii funkcjonalnej, systematyki i filogenezy, PWN, W-wa 5. A. Szwejkowska, J. Szwejkowski, 1992, Botanika, PWN, W-wa 6. H. Benedykt, 1999, Procesy ewolucji biologicznej, PWN 7. W. N.Jarygin (pod red.), 2002, Biologia. Podręcznik dla studentów kierunków medycznych, Wyd. Lek. PZWL 8. C.A. Villee, 2005,Biologia, PWRiL 9. P.B. Weisz, 1977, Biologia ogólna, PWN.

**Supplementary literature:** E. Malinowski, 1980, Anatomia roślin, PWN, W-wa,, Z. Hejnowicz, 2002, Anatomia i histogeneza roślin naczyniowych, PWN, W-wa.

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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 60

Student's independent work: 90