Faculty of Biology and Biotechnology

Course title: APPLICATION OF MOLECULAR TECHNIQUES IN ANIMAL TAXONOMY

ECTS credit allocation (and other scores): 2

Semester: spring

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

Branch of science: Natural sciences

Language: English

Number of hours per semester: 30 h.

Course coordinator/ Department and e-mail: Lech Kirtiklis; Department of Zoology; leo@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Tissue sampling and animal genomic DNA extraction using various techniques; taxonomic analyses employing molecular biology tools (PCR, restriction analysis, agarose gel electrophoresis, DNA sequencing) to identify bird sex and differentiate certain fish species; construction of markers based on DNA size differences; application of nuclear and mitochondrial DNA polymorphisms to develop intra- and interspecies markers for animal taxa.

LECTURES: A brief historical overview of the need and attempts to classify animals; an introduction to systematics and taxonomy, with explanations of their interrelationships and basic taxonomic concepts; molecular markers and their applications in animal taxonomy.

LEARNING PURPOSE: To equip students with foundational knowledge in animal taxonomy and to expand their understanding of how molecular biology techniques can address research questions in animal taxonomy and biodiversity.

On completion of the study programme the graduate will gain:

KNOWLEDGE: The student understands basic concepts related to animal taxonomy, genome structure and molecular biology techniques; knows the principles of research planning using molecular biology techniques and research tools applied in animal taxonomy; understands how to select the optimal research approach based on the analyzed problem.

SKILLS: The student is able to plan and perform taxonomic analyses using molecular biology tools; operate laboratory equipment; apply research tools at different stages of taxonomic analyses; collect and interpret empirical data to formulate appropriate conclusions; use the NCBI database and computer programs relevant to molecular biology; interact and work effectively in a team.

SOCIAL COMPETENCIES: The student is ready to recognize the importance of knowledge in molecular taxonomy for addressing contemporary issues in animal biodiversity; to mitigate risks associated with research tools; to establish safe working conditions.

Basic literature: 1.) Avise J.C., Molecular markers, Natural History, and Evolution (Second Edition), Wyd. Sinauer Associates, Inc., R. 2004

Supplementary literature: 1.) Various authors, scientific articles suggested by the course instructor, Scientific Journals, no older than from 2019.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 32 h.
Student's independent work: 8 h.