

Course title: CYTOGENETICS

ECTS credit allocation (and other scores): 3.5

Semester: autumn

Level of study: ISCED-6-first-cycle programmes (EQF-6)/ ISCED-7-second-cycle programmes (EQF-7)

Branch of science: Natural sciences

Language: English

Number of hours per semester: 40 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: Preparation of chromosomes, karyological analysis, classical chromosome staining and banding techniques. Selected issues concerning the scope and methods of chromosome studies – presentation.

LECTURES: Basics of cytogenetics, preparation and staining of chromosomes, chromosome banding techniques, karyotype analysis of some animal species. Application of cytogenetic features in animal systematics, comparative biology and phylogenetic analysis. Chromosomal rearrangements and speciation. Examples of karyotype evolution. Identification of homologous chromosomes in animals. Methods of karyological analysis: classical, banding, molecular (*in situ* hybridization). Chromosomal aberrations, sister chromatid exchange, abnormalities in the course of mitosis and meiosis. Sex chromosomes and their evolution; cytogenetic analysis of ploidy level and meiosis as a tool for understanding changes in the reproductive system and inheritance modes in vertebrates.

LEARNING PURPOSE: Familiarizing the student with the processes and changes occurring at the chromosome level. Familiarizing the student with the methods of chromosome preparation and some research tools used in classical cytogenetics.

On completion of the study programme the graduate will gain:

Knowledge: The student understands basic concepts related to the structure, morphology and evolution of chromosomes; optimal approaches in the preparation and chromosome staining; knows the scheme of caryological analysis .

Skills: The student uses various methods of chromosome preparation and staining; is able to describe a karyotype.

Social Competencies: The student is ready to use of good laboratory practices; conduct in accordance with the principles of ethics; demonstrate care for the environment and notice the risks associated with the use of reagents that may have a negative impact on the environment; showing creativity and openness in team cooperation; improving the knowledge.

Basic literature: 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: 41 h (lectures: 15 h, classes: 25 h, consultations: 1 h).

Student's independent work: 46,5 h.