Title:	**Principles of genomics**
Lecture hours:	15 - Lecture 15 - Laboratory
Study period: (summer/winter)	Winter OR Summer
Number of credits:	4 ECTS
Assessment methods:	Laboratories Project preparation
Language of instruction:	English
Prerequisites:	High school biology Basic computer skills General knowledge on principles of genetics
Course content:	Introduction to genomics. Genome research techniques: restriction enzymes, vectors, gene banks, DNA libraries, electrophoresis, hybridization, PCR, sequencing and sequence assembly. Second- and third-generation DNA sequencing methods.Genome assembly methods and strategies. Gene localization methods in DNA sequences (sequence tracking and experimental analysis). Gene function studies (computer and experimental analysis). Size and organization of pro- and eukaryotic genomes (nuclear, mitochondrial and chloroplast genomes). Model organisms. Whole-genome projects. Mechanisms of genome evolution: demographic mechanisms (genetic drift, migration, mating system), natural selection, linkage and linkage disequilibrium, mutation models, molecular clock.
Learning outcomes:	Student will understands complex biological phenomena occurring at various levels of life organization, including the mechanisms of genome evolution and their organization in pro- and eukaryotic genomes. The course will provide knowledge regarding techniques of sequencing, assembly and analysis of genomes, and their practical use in research.
Name of lecturer:	dr. Bartosz Kamil Ulaszewski
Contact (email address):	ulaszewski@ukw.edu.pl
Literature:	T.A. Brown (2007). Genomes. Taylor & Francis Ltd Current original papers and review articles