Study Programme : BSc in Biology

Degree level: Bachelor degree

Course Title: Evolutionary Biology

Professor: dr Vesna Milankov

Required Course

Number of ECTS: 6

Prerequisites:

Course Objective:

Evolution as the cornerstone of modern biology provides the concepts and principles in studying biological diversity. The aims of the course Evolutionary Biology are to provide a better knowledge of the population genetic structure of the species, precise identification of the species, evolutionary mechanisms responsible for origin and maintenance of molecular and phenotypic diversity. The course gives insight into evolutionary mechanisms responsible for the strategy of each species and evolutionary mechanisms of biochemical adaptation as well.

Course Outcome:

Understanding evolutionary processes and mechanisms, a functional organization and diversity, and quantification of genetic variability of the evolutionary units (as its evolutionary potential), which generate and maintain genetic diversity, are main outcomes of the Evolutionary Biology course. Evolutionary understanding of biological phenomena are applicable in agriculture, veterinary science, pharmacy and medicine.

Course Content:

Theoretical part

Darwinism and the Fact of Evolution. Methods of evolutionary analysis: experimental approaches; the comparative method; reconstructing history. Mechanisms of evolutionary change: mutation: the origin of new genes and alleles; migration; genetic drift, natural selection. The adaptive landscape. Agents of selection and the nature of adaptations: adaptations to the physical environment; adaptations to the biological environment.

Mechanisms of speciation: species concepts; mechanisms of isolation; mechanisms of divergence. The origin of life, and Precambrian evolution. The Cambrian explosion and beyond. Mass extinction and their consequences. Human evolution. Biodiversity and conservation.

Practical part

Population: the Hardy-Weinberg equilibrium; linkage equilibrium; linkage disequilibrium and evolution. Population fragmentation: causes. Phenotypic variability: adaptive importance. Evolutionary change in nucleotide sequences. Evolution by gene duplication and domain shuffling. Gene families. Multiple-copy coding sequences. Homeobox genes. Evolution by transposition and horizontal transfer. Genome organization and evolution.

Reading List:

Milankov, V. (2007) Biološka evolucija. PMF, Novi Sad

Tucić, N. (2003) Evoluciona biologija. II dopunjeno i promenjeno izdanje. NNK International, Beograd.

Tucić, N. (1999) Evolucija, čovek i društvo. Dosije i Akademska alternativna mreža, Beograd.

Total hours:

Lectures: 3	Practicals: 2	Other:	Student research work:

Methods of instruction:

video bean and overhead presentation

Assessment (maximum number of points 100)

Requirements	**points**	**Final exam**	**points**
Active participation in lectures	5	Practical exam	20
Active participation in practicals		Oral exam	45
Test(s) or		30	
Pre-exam testing			