Course Unit Descriptor

Study Programme: Master of Science in Teaching Biology

Course Unit Title: Evolutionary Conservation Biology

Course Unit Code: IB57

Name of Lecturer(s): Dr Vesna Milankov, Dr Ljubinka Francuski Marčetić

Type and Level of Studies: Master Academic Degree

Course Status (compulsory/elective): Elective

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 6

Prerequisites: None

Course Aims:

Evolutionary conservation biology is an integrative approach to managing species in conjunction with ecological interactions and evolutionary processes. The main challenge for evolutionary conservation biology is to identify strategies for managing genetic and ecological conditions such as to ensure the continued operation of favorable evolutionary processes in natural systems embedded in a rapidly changing world.

Learning Outcomes:

The course provides the students with the appropriate principles and tools to tackle the dynamics of adaptive trait substitutions and the evolutionary implications of complex ecological settings. The cours provide the conceptual basis for understanding the genetics of biological problems in conservation.

Syllabus:

Theory

Introduction: Demography, Genetics, and Ecology in Conservation Biology, Toward an Evolutionary Conservation Biology, Environmental Challenges and Evolutionary Responses. Genetics and conservation. Theory of Extinction: From individual interactions to population viability, Spatial dimensions of population viability. The pace of adaptive responses to environmental change. Responses to environmental change: Adaptation or extinction, Empirical evidence for rapid evolution, Genetic variability and life-history evolution, Environmental stress and Quantitative genetic variation. Genetic and ecological bases of adaptive responses: Fixation of new mutations in small populations, Quantitative-genetic models and changing environments, Adaptive dynamics and evolving biodiversity. Spatial Structure: Genetic structure in heterogeneous environments, Adaptive responses to landscape disturbances. Hybridization: Natural and antropogenic hybridization.

Practice

Units of Conservation: Systematics and taxonomy, Phylogeny reconstruction. Use of molecular markers in recognition of evolutionarily conservation units. Integrating genetic, phenotypic, and environmental information. Genetic Variation in Natural Populations. Metapopulations and fragmentation. Population Subdivision: F and Q statistics. Genetics and conservation: wild populations, captive populations. Conservation Breeding and Restoration. Forensic and Management Applications of Genetic Identification.

Required Reading:

1. Ferriere, R., i sar. (2004) Evolutionary Conservation Biology. Cambridge University Press.

2.Alndorf, F.W., Luikart, G. (2006) Conservation and the genetics of populations. Willey-Blackwell.

3. Milankov, V. (2007) Osnovi konzervacione biologije I. Skripta.

Weekly Contact Hours:	**Lectures:** 2	**Practical work:** 2

Teaching Methods:

Video beam and overhead presentation

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation		written exam	
Practical work		oral exam	70
Test(s)		…….	
Seminar(s)	30		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.