**(Table 5.2) Course unit description**

**Study program** : MOLECULAR BIOLOGY

**Type and level of studies**: Master academy study – II level of studies

**Course unit:** Molecular principles of conservation biology

**Teacher in charge :** Vladica M. Simić, Ph.D.

**Language of instruction**: English

**ECTS**: 6

**Prerequisites**: /

**Semester** : Summer semester

**Course unit objective**

The aim of the course is to teach students the knowledge of the molecular basis of conservation biology in order to conservation genetic diversity.

**Learning outcomes of Course unit**

The outcome of the course is to gain basic knowledge and skills needed to implement molecular principles and methods in conservation of biodiversity

**Course unit contents**

*Theoretical classes*

Conservation biology and molecular biology mutual relationship. The genetic structure of natural populations. Genetic diversity, measurement of genetic diversity, variability in space and тиме -centered and peripheral populations, genetic diversity of individual loci. Multi locus systems, evolution in large populations. The evolution in small populations, genetic drift, founder effect, the effect of passing through a population bottleneck. Inbreeding in large and small populations. Inbreeding depression, loss of genetic diversity in small populations, population fragmentation. The reduction of genetic diversity in a structured population - average heterozygosity. Maintenance of genetic diversity in populations of large - balancing selection. The nucleotide diversity. Maintaining genetic diversity in small populations. Outbreeding depression. Molecular genetic management of wild populations. Molecular genetic management of introduced species. Molecular genetic management of reintroduced species.

*Practical classes*

Examples of application of molecular methods in taxonomy of organic species. Molecular methods for identifying and defining conservation units. Methods of chemotaxonomy and analysis of the structure of DNA. Molecular markers. Phylogeny and phylograms. Determination of average heterozygosity of natural populations. Examples of the molecular basis of taxonomic differentiation of crayfish from fam. Astacidae. Examples of the molecular basis of taxonomic differentiation of some fish species (complex of species).

**Literature**

Fred Van Dyke. Conservation Biology. Springer Science and Busines media. 459pp, 2010.

Stanton Braude, Bobbi S Low. An introduction to methods & Models in Ecology, Evolution and Conservation Biology. Princeton University Press Princeton and Oxford. 267pp, 2010.

| **Number of active teaching hours** | | | | **Other classes** |
|---|---|---|---|---|
| Lectures: | Practice: | Other forms of classes: Mentoring (consultative) system | Independent work: | |

**Teaching methods**

Lectures, power-point presentations, Internet use, seminars, field and laboratory practice

**Examination methods ( maximum 100 points)**

| **Exam prerequisites** | **No. of points:** | **Final exam** | **No. of points:** |
|---|---|---|---|
| Student's activity during lectures | 10 | oral examination | 50 |
| practical classes/tests | 40 | written examination | |
| Seminars/homework | | ..... | |
| Project | - | | |
| Other | - | | |

**Grading system**

| **Grade** | **No. of points** | **Description** |
|---|---|---|

| | | |
|---|---|---|
| 10 | 91-100 | Excellent |
| 9 | 81-90 | Exceptionally good |
| 8 | 71-80 | Very good |
| 7 | 61-70 | Good |
| 6 | 51-60 | Passing |
| 5 | < 51 | Failing |