UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2016/17/1
Course:	Evolutionary genetics
Code:	VEMKLIK112E
Responsible department:	Department of Limnology
Department code:	MKLI
Responsible instructor:	dr. András Liker

Course objectives:

The aim of the course is to provide knowledge in basic evolutionary genetics. We discuss the physical structure and functioning of the DNA, Mendel's laws, and the basics of quantitative genetics. The course also includes population genetic foundation of the evolutionary theory, and molecular genetic methods used in ecology.

Course content:

1. Introductory lecture. 2. The structure and properties of DNA. The genome of prokaryotes and eukaryotes. 3. The structure and functions of genes. Gene regulation. 4. Cell division, mutation, recombination, and the variability of natural populations. 5. Mendel's laws. Interactions between genes. 6. Linkage and the genetics of sex-linked traits. 7. Quantitative genetics. 8. Basic concepts in population genetics. The Hardy-Weinberg equilibrium. 9. Fitness, selection, mutation. 10. Migration and inbreeding. 11. Genetic drift. The neutral theory of evolution. 12. Analyses of the genetic structure of wild populations. 13. Molecular genetic markers. 14. Molecular genetic methods in ecology. 15. Closing lecture, summary of the course.

Requirements, evaluation and grading:

During the exam students have 20-25 minutes to explain their exam topics. Evaluation: Mark 1 (unacceptable): the student is unable to provide a brief outline of the topic and unfamiliar with the definitions of basic ideas. Mark 2: the student is able to understand the basic ideas of the course. Mark 3: the student is able to understand the basic ideas of the course, and can discuss the basic logical structure of his/her exam topic with some help from the teacher. Mark 4: the student is able to discuss logically all important knowledge of his/her exam topic, but unfamiliar with the relevant literature. Mark 5 (excellent): the student is able to discuss logically and in detail all important knowledge of his/her exam topic, and familiar with the relevant literature.

Required and recommended readings:

Weaver, R.F. és Hedrick, P.W. 2000. Genetika, Panem Kiadó. Pecsenye, K. 2007. Populációgenetika. Pars Kft., Budapest Maynard Smith, J. 1998. Evolutionary genetics (second edition). Oxford University Press, Oxford. Hartl, D.L. 2000. A primer of population genetics (second edition). Sinauer, Sunderland, Massachusetts. Avise, J.C. 2004. Molecular markers, natural history, and evolution (second edition). Sinauer, Sunderland, Massachusetts.