



## COURSE DATASHEET

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|--------------------------------|-------------------------|
| <b>Semester:</b>               | 2014/15/2               |
| <b>Course:</b>                 | Evolutionary biology    |
| <b>Code:</b>                   | VEMKLIM112E             |
| <b>Responsible department:</b> | Department of Limnology |
| <b>Department code:</b>        | MKLI                    |
| <b>Responsible instructor:</b> | dr. András Liker        |

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### Course objectives:

Understanding the major micro- and macroevolutionary processes, and important steps in the history of life. Using evolutionary theory to explain the diversity of life, from genes to ecosystems.

### Course content:

1. History of evolutionary biology. Alternative theories for the origin of life and changes in organisms. 2. Natural selection, adaptation, fitness. Types and rates of selection. Methods for measuring selection. 3. The unit of selection: individual, group and kin selection. The problems of group selection, and its potential applications. The evolution of eusociality in animals. 4. Sexual selection. Social selection. Evolutionary game theory. 5. Co-evolutionary changes. Host-parasite and predator-prey systems. Sexual conflict in reproduction and its consequences. 6. Neutral theory of molecular evolution. 7. Geographic and biological isolation. Allopatric and sympatric speciation. Adaptive radiations. 8. Investigating phylogenetic relationships. The use of phylogenetic comparative methods in evolutionary research. 9. Gradual and punctual theories of evolution. General trends in the phylogeny of animals. 10. The rate of speciation and extinction. Causes and consequences of mass extinctions during the history of life. 11. Major steps in biological evolution: the origin of chemical replicators, prokaryotes, eukaryotes, and multi-cellular organisms. 12. The evolution of major groups of organisms (e.g. animal and plant phyla, vertebrate classes). The evolutionary significance of large-scale geological processes. 13. The evolution of the primates and hominids. 14. Evolution and man: The domestication of animals and plants. The adaptation of wild populations to human-altered environments. The effects of urbanization. The effects of man on species extinction. 15. Summary, closing lecture.

### 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:

Ridley, M. (1993) Evolution. Blackwell, Oxford. Freeman, S. & Herron, J.C. (2001). Evolutionary analyses.



# UNIVERSITY OF PANNONIA

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### Required and recommended readings:

Prentice Hall, Upper Saddle River, NJ. Maynard Smith, J. & Szathmáry, E. (1997) Az evolúció nagy lépései. Scientia, Budapest.