Study programme: PhD in Ecology	
Level: PhD degree	
Course title: Data analysis in hydrobiology	
Lecturer: dr Branko Miljanović	
Status: elective	
ECTS: 15	
Requirements: students are obliged to have passed the elementary course of Hydrobiology with grade higher than 8; optional – passed or attended course Statistics with math or Methodology of Scientific Research in Biology	
Learning objectives The objective of the course is to teach students about the main principles of the data analysis, by using the most up-to-date statistical techniques applicable in the freshwater biology research.	
Learning outcomes After passed exam a student should be able to independently analyse any type of hydrobiological data, to adequately apply the analytical protocol in the data analysis and to be able to make an independent statement regarding the results of the statistical analyses.	
Syllabus *Theoretical instruction* Types of data in hydrobiology and analytical protocol, Study design and planning of the hydrobiological research, Exploratory and preliminary data analysis, Univariate and multivariate response, Analysis of variance and covariance, Correlation and Regression, Multiple regression, Statistical models, Data analysis using computer language "R", Presentation and discussion of results. *Practical instruction* Fullfilment of the research project within which the student would apply the statistical techniques of data analysis. In the course of the research, a student would have used the software package "Statistica" or "R".	

Literature

Quinn, G. & Keough, M. (2002) *Experimental Design and Data Analysis for Biologists*. Cambridge University Press, Cambridge, UK.

Zuur A., Ieano E. & Smith G. (2007) *Analysing Ecological Data*. Springer, New York.

Clarke K.R. & Warwick R.M. (2001) *Change in marine communities: an approach to statistical analysis and interpretation*, PRIMER-E: Plymouth, UK.

Elliot, J. (1971) Some methods for the statistical analysis of sampIes of benthic invertebrates. Sci. Publ. 25. Freshwater Biological Association, Ambleside, Westmorland, U.K.

Zuur A., Ieno E., Walker N., Saveliev A. & Smith G. (2009) *Mixed Effects Models and Extensions in Ecology with R*. Springer-Verlag, New York.

Weekly teaching load				Other:
Lectures: 5	Exercises:	Other forms of teaching:	Student research: 5	

Teaching methodology
Lectures – oral presentations using video bim, practical course – the processing and identification of the hydrobiological samples.

Grading method (maximal number of points 100)			
During the semester	points	**Final exam**	points
student research project	**50**	oral exam	**50**