

Study Programme: PhD in Ecology
Course Unit Title: Data analysis in aquatic biology
Course Unit Code: DNE014
Name of Lecturer(s): Dr. Tamara Jurca
Type and Level of Studies: PhD studies
Course Status (compulsory/elective): elective
Semester (winter/summer): winter or summer
Language of instruction: english
Mode of course unit delivery (face-to-face/distance learning): face-to-face
Number of ECTS Allocated: 15
Prerequisites: : 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
<p>Course Aims:</p> <p>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.</p>
<p>Learning Outcomes:</p> <p>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.</p>
<p>Syllabus:</p> <p><i>Theory</i></p> <p>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.</p> <p><i>Practice</i></p> <p>Fulfilment 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”.</p>
<p>Required Reading:</p> <p>Quinn, G. & Keough, M. (2002) <i>Experimental Design and Data Analysis for Biologists</i>. Cambridge University Press, Cambridge, UK.</p> <p>Zuur A., Ieno E. & Smith G. (2007) <i>Analysing Ecological Data</i>. Springer, New York.</p> <p>Clarke K.R. & Warwick R.M. (2001) <i>Change in marine communities: an approach to statistical analysis and interpretation</i>, PRIMER-E: Plymouth, UK.</p> <p>Elliot, J. (1971) Some methods for the statistical analysis of samples of benthic invertebrates. <i>Sci. Publ.</i> 25.</p>

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 Contact Hours: 5

Lectures:

Practical work: 5

Teaching Methods: Lectures – oral presentations using video bim, practical course – the analysis of hydrobiological data through series of written tasks.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation		written exam	50
Practical work		oral exam	
Preliminary exam(s)		
student research project	50		

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