Course Unit Descriptor

Study Programme: BIOSTATISTICS

Course Unit Title: BIOSTATISTICS

Course Unit Code: 3ДВМ2О03

Name of Lecturer(s): Dr Mutavdžić Beba, Associate Professor; dr Miroslav Zorić, Research Associate

Type and Level of Studies: PhD studies

Course Status (compulsory/elective): compulsory

Semester (winter/summer): winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 4

Prerequisites: None

Course Aims:

Data from agricultural research are characterized by high complexity. Hence, the application of adequate methods of statistical analysis of data is of key importance for the correct conclusion. The course provides students with theoretical knowledge focusing on practical application in a free statistical software - R.

Learning Outcomes:

After completing the course, the student should be able to recognize the specifics of his data and possible methods of statistical analysis. Also, the student is able to set up the hypothesis of research and in accordance with that, apply a statistical analysis and perform the correct interpretation of the results.

Syllabus:

Theory

Definition and concept of biometrics in agricultural research. Estimates of biometrics (data, variables, variations, basic set, sample, distribution). Descriptive and Inferential Statistics (Cetal Weekly Measures and Variability Indicators with Alternative Robust Indicators). Theoretical statistical distribution (continuous and discontinuous). Visualization of the distribution of empirical data (histogram, box diagram, quantile-quantile diagram, dotted diagram). Statistical inference for means and proportions. Regression analysis (concept and significance). Types and models of regression analysis. Method of estimation of parameters and statistical inference. Assumptions for the application of regression analysis. Diagnostic tools in regression analysis. Alternative methods of regression analysis. Experimental plans in agricultural research (principles of experiments and types of plans). Formulations of the model with fixed and random effects for analysis of experimental plans. Model assumptions and diagnostics. Analysis of experimental plans with repeated measurements. Analysis of experimental plans with discrete variables. Multivariate analysis (definition, significance and assumptions of multivariate analysis). Principal components analysis. Analysis of clustering and classification (cluster and discriminatory analysis). Non-parametric statistics (definition, significance and assumptions of nonparametric statistics methods). Non-parametric tests for two or more samples. Non-parametric regression. Bootstrap methods and permutations.

Practice

Working in statistical software, illustration of the above methods through adequate examples.

Required Reading:

1. Presentations from lectures and examples with exercises in statistical software - R.
2. Gomez, K. A., Gomez, A. A. (1984). Statistical Procedures for Agricultural Research. Wiley &Sons
3. Zar, J. (2009). Biostatistical Analysis. - 5th edition, Prentice-Hall Inc.

Weekly Contact Hours: 2+1	**Lectures: 2*15**	**Practical work:1*15**

Teaching Methods:

Lectures, seminar papers, practical work, consultations.

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations		**Final exam**	
Active class participation		written exam	

Practical work	60	oral exam	40
Preliminary exam(s)		…….	
Seminar(s)			
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			