Statistical Methods (3MI09NVC01P) for PhD Students

I. GENERAL INFORMATION

Number of hours per semester: 26 (2 practices/week)

Credits: 6

Semester: spring

Language: English

Prerequisites: basic mathematics

Course type: mandatory/optional

Department: Dpt. of Biometrics and Agricultural Informatics

Course leader: Dr. Ladányi, Márta PhD, associate professor, head of department

Course description: During the semester, based on the knowledge the students have acquired at BSc/MSc level standard Biometrics and Statistics courses, some chapters of advanced statistics will be discussed with complex applications in computer lab in a practical way with many applications in agriculture that are adjusted specially to the demands of the current PhD students, considering special problems of data management and documentation. We use the statistical software IBM SPSS 25.

Requirements: At the end of the semester, the students have to write a report applying at least one of the methods in their own special fields.

Assessment, grading: Grades are given upon a student project report submitted at the end of the semester.

Recommended readings:

Field, A. (2009) Discovering Statistics using SPSS. SAGE Publications Ltd. London, California India, ISBN 978-1-84787-906-6 ISBN 978-1-84787-907-3

Special handouts are available during the course.

II. DETAILED PROGRAM

Discussed chapters:

1. Statistical hypothesis testing, revision:
   Data types, outliers, missing data, Type I and Type II errors, significance level, normality tests, one- and two-sample parametric tests; one-way ANOVA;
2. Experimental design, one- and two-way ANOVA, ANOCOVA models, GLM, GLMM, repeated measures ANOVA, post hoc tests, graphical representation
3. Linear and nonlinear uni- and multivariate regression models, regression diagnostics, repeated measures regression, confidence intervals and bands, collinearity, PCA regression, quantile regression, write-up;
4. Skewness and kurtosis tests, data transformation, sampling, sample size and power calculation
5. Crosstabulation
6. Nonparametric methods

Learning outcomes: After having completed the course, students will be able to manage data and to evaluate the observations choosing the appropriate method correctly, moreover, to report the results in a suitable manner. They can apply their skills in publishing scientific papers as they learn how to present and reason their findings and conclusions professionally.

Attendance policy: Students may be absent for 2 tutorial meetings. Missing more than two tutorial meetings will result in loss of credit for the module. Please note that the two absences are provided for sickness, so save your absences for situations you really need them.

Test(s) during the course: -

Programme: The course is for PhD students.