Statistical methods of decision support systems in extension service (3MI09NAK43M)

I. GENERAL INFORMATION

Number of hours per semester: 1 lecture + 1 practice/week

Credits: 3

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: The aim of the course is to provide practice-oriented knowledge - based on previously acquired IT basic knowledge - on information systems and complex tasks and new IT processes (data processing and dynamic data presentation using MS Excel, relational database management using MS Access, statistical evaluation methods using RStudio), which provide a broad basis for solving IT and analytical tasks related to decision support.

Requirements: To get a signature, active participation is needed on the classes (by uploading practical solutions to the e-learning system at the end of the classes) with maximum 2 absents. During the semester students have to
- write a test (theoretical and practical part) of the topic of Excel+Access (in the middle of the semester)
- prepare a homework project based on student's own scientific interest using the learnt statistical evaluation methods (write an essay and present it): collect data, set scientific questions and goals based on the data, analyse and interpret the results, answer the asked questions. Deadline for the essay: end of the semester. 10 minutes presentation of the project: on the exam

Assessment, grading: Grades are given based on the quality of the test and homework project using the total points the student have, grades are calculated based on the following percentage categories: 0-49%: Fail (1), 50-60%: Pass (2), 61-75%: Satisfactory (3), 76-85%: Good (4), 86-100%: Excellent (5).

Recommended readings:
- Handouts, lecture notes

- Joyce J. Nielsen (2016) Microsoft Official Academic Course, MICROSOFT EXCEL 2016. Wiley. ISBN: 978-1-11-927299-1
https://dit.ie/media/ittraining/msoffice/MOAC_Excel_2016_Core.pdf
- Mary Lemons (2016): Microsoft Official Academic Course, MICROSOFT ACCESS 2016. Wiley. ISBN: 978-1-11-927443-8
https://dit.ie/media/ittraining/msoffice/MOAC_Access_2016.pdf
- Andy Field, Jeremy Miles, Zoë Field (2012): Discovering statistics using R. SAGE Publications. ISBN 978-1-4462-0045-2, ISBN 978-1-4462-0046-9
- Rice W virtual Lab in Statistics: http://onlinestatbook.com/rvls.html

II. DETAILED PROGRAM

Discussed chapters:

1. Overview of agricultural extension, information and communication technology (ICT) in extension service (theoretical)
2. Overview of decision support systems and fields of agricultural informatics (theoretical)
3. EUROSTAT, data search, structure, export and data management in MS Excel (practical)
4. Data visualisation, analysis and pivot tables with charts in Excel (practical)
5. Database management using MS Access: tables, queries, forms and reports (practical)
6. Basic statistical analysis using RStudio: descriptive statistics, distributions, confidence intervals, hypothesis testing (t-tests, chi-square test for independence, Fisher's Exact test), modeling (ANOVA, linear regression) (practicals with theoretical background)

Learning outcomes: After having completed the course, students will know a collection of useful agricultural decision support systems. They will be able to search and manage data and to create relational databases, where they can manage tables, queries, forms and reports. Moreover, they can determine based on specific scientific question, which basic data analysis method would be appropriate to answer it, and they can apply the selected statistical method and interpret the results. They can make conclusions based on the findings.

Attendance policy: Students may be absent for 2 classes. Missing more than two classes 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: A test from Excel+Access part during the semester, and a homework project (essay and presentation) applying the learnt statistical methods at the end of the semester (presentations can be made on exams).

Programme: MSc in Horticulture Erasmus