University of Zagreb Faculty of Agriculture
Svetošimunska cesta 25, 10000 Zagreb
Phone: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

Introduction to SAS and R programs (277449)

Course coordinator

Prof. Alen Džidić, PhD

Course description

Student will be introduced to statistical computer programs SAS and R in Windows and MAC OSX environment. In the first lecture historical overview of both programs together with actual versions. Structure of both programs will be shown in details. Course will deal with data import and manipulation with graphical presentation. SAS program main DATA and PROC steps will be shown in working examples. Special attention will be given in SAS to the PROC SQL and PROC IML procedures which are usually used when working with databases and matices. In R installation of particular packages will be shown for some special data manipulation techniques.

ECTS: **6.00**

E-learning: **L1**

Teaching hours: 60
Lectures: 14
Practicum: 42
Seminar: 4

Lecturer

- Prof. Alen Džidić, PhD
- Assoc. Prof. Dragica Šalamon, PhD

Associate teacher for exercises

- Assoc. Prof. Dragica Šalamon, PhD
- Prof. Alen Džidić, PhD

Associate teacher for seminars

- Assoc. Prof. Dragica Šalamon, PhD
- Prof. Alen Džidić, PhD

Grading

Sufficient (2): 60-70%
Good (3): 71-80%
Very good (4): 81-90%
Excellent (5): 91-100%

Description

Student work during field work and exercises will be evaluated. Test and oral exam will test student knowledge from the whole course.

Type of course

- Graduate studies / MS Courses taught in English (Elective course, 1 semester, 1 year)

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General competencies

Installation of both program, data manipulation, graphical presentation and usage of some intermediate programming techniques will be acquired during the course. Students will be able to write code for all mentioned techniques.

Types of instruction

- Lectures
- Seminars
- Exercises

Learning outcomes

Learning outcome	Evaluation methods
Individually write code needed for import and data preparation for further statistical analysis.	Written exam, oral exam
Individually write code for basic statistical analysis and their graphic representation.	Written exam, oral exam
Individually prepare the data from the data base for further statistical analysis.	Written exam, oral exam
Individually work and execute various calculations in SAS and R computer programs.	Written exam, oral exam

Working methods

Students' obligations

Student attendance during lectures, exercises and seminars.

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Weekly class schedule

1. Introduction - Description of the historical development of SAS and R programs.
2. Data manipulation - Data import and data manipulation. Preparation of the data for statistical analysis.
3. Data manipulation - Data import in SAS and R programs.
4. Data manipulation - Data manipulation in SAS program.
5. Data manipulation - Data manipulation in R program.
6. Data manipulation - Preparation of the data for statistical analysis in SAS program.
7. Data manipulation - Preparation of the data for statistical analysis in R program.
8. Graphical data representation - Graphical data representation in SAS and R programs.
9. Basic statistical analysis, work with procedures in SAS and packages in R - Basic statistical analysis in SAS and R programs. Usage of PROC SQL and PROC IML in SAS program and work with R packages.
10. Basic statistical analysis - Basic statistical analysis in SAS program.
11. Basic statistical analysis - Basic statistical analysis in R program.
12. Work with procedures in SAS - Work with PROC SQL in SAS program.
13. Work with procedures in SAS - Work with PROC IML in SAS program.
14. Work with packages in R - Installation and work with packages in R.
15. Final seminar in both programs - Final seminars and concluding remarks.

Obligatory literature

1. Elliott, A. C.,Wayne, A. (2010). SAS essentials : a guide to mastering SAS for research . Woodward. Jossey-Bass - A Wiley Imprint, USA.
2. PROC SQL by Example: Using SQL within SAS® (2008). Howard Schreier, SAS Institute Inc., Cary, NC, USA.
3. Kabacoff, R. I. (2011).R in action: Data analysis and graphics with R. Manning Publications.
4. Zuur, A. F., Leno , Elena N., Meesters, E. (2009). A Beginner’s Guide to R . New York: Springer.
5. SAS IML Users guide (2004). Cary, NC : SAS Institute Inc. http://support.sas.com/documentation/onlinedoc/91pdf/sasdoc_91/iml_ug_7306.pdf

Recommended literature

1. Wickham H. and Grolemund G. R for Data Science. O Reilly - https://r4ds.had.co.nz/
2. http://science.geof.unizg.hr/todo-platform/

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