

Ljubljana Summer School *Take the Best from East and West*

8 – 24 July 2024

STATISTICAL ANALYSIS WITH R

Bachelor course (ECTS: 6)

Course leader:

LOTRIČ DOLINAR Aleša, University of Ljubljana, School of Economics and Business

Aleša Lotrič Dolinar obtained her PhD in 2007 at Faculty of Economics, University of Ljubljana. From 1998 on she has been employed at Faculty of Economics, University of Ljubljana, Academic unit for Mathematics, Statistics and Operational Research. As assistant professor she has been the head or cooperating at various statistical courses: Introductory Statistics, Statistical Analysis, Research methods and techniques, Quantitative Methods in Finance, Quantitative Methods 1 for Management and Economics in Health Care. She is an active researcher and regular conferences participant in the field of statistics and its applications. She is an expert in statistical methods and an experienced user of statistical software (Stata, R, SPSS).

Aims of the course:

- Become familiar with and upgrade basic statistical methods.
- Obtain basic knowledge about sampling, parameter estimation, analysis of relationship between variables, time series analysis, and survival analysis.
- Develop skills and ability to use statistical analysis software R.
- Develop the ability of critical thinking and evidence-based inference.

Prerequisites:

Basic descriptive statistics.

Course content:

DATE	DAILY TOPIC/SESSION
Monday, 8 July	Course introduction (1h)
Tuesday, 9 July	Lectures (3h): Basics, Probability distributions, Normal distribution
Wednesday, 10 July	Lectures (3h): Basics of sampling, Confidence intervals
Thursday, 11 July	Lectures (3h): Hypothesis testing (basics, arithmetic mean)
Friday, 12 July	Lectures (3h): Hypothesis testing, ctd. (ANOVA, proportion)
Monday, 15 July	Lectures (3h): Relationship between variables, Combination table with test for frequency matching
Tuesday, 16 July	Lectures (3h): Regression analysis (basics, simple regression)

Wednesday, 17 July	Lectures (3h): Regression analysis, cdt. (multiple regression, dummy explanatory variable)
Thursday, 18 July	Lectures (3h): Time series analysis (linear and exponential trend)
Friday, 19 July	<i>No lectures (day off)</i>
Monday, 22 July	Lectures (3h): Time series analysis, ctd. (structural break, periodical component), Survival analysis
Tuesday, 23 July	Preparation for final examination + Q&A (3h)
Wednesday, 24 July	<i>Final examination (exam, short hands-on analysis with R)</i>

Course materials / List of readings:

- course materials
- Lane, David (2013): Introduction to Statistics. E-book, <https://open.umn.edu/opentextbooks/textbooks/459>
- Navarro, Danielle (2018): Learning Statistics with R: A tutorial for psychology students and other beginners. E-book, <https://open.umn.edu/opentextbooks/formats/891>
- Keller, G.: Managerial Statistics. SOUTH-WESTERN CENGAGE Learning, 2009 (or newer)

Teaching and examination methods:

- Lectures with hands-on use of R.
- Written exam, short simple hands-on analysis with R.

Grading scale:

DEFINITION	%	LOCAL SCALE	ECTS SCALE	Grade (USA)
exceptional knowledge without or with negligible faults	92-100	10	A	A+, A, A-
very good knowledge with some minor faults	85-91	9	B	B+, B
good knowledge with certain faults	77-84	8	C	B
solid knowledge but with several faults	68-76	7	D	C+, C, C-
knowledge only meets minimal criteria	60-67	6	E	D+, D
knowledge does not meet minimal criteria	<60	5	F	