

M095	Statistical Practice	L	S	E	ECTS 6
		1	1	2	

Course objectives. The objective of this course is to develop skills for statistical data analysis which include computer skills and skills for the application of basic statistical models.

Course prerequisites. Introduction to Probability and Statistics.

Syllabus.

1. Introduction to statistical software. Descriptive statistics.
2. Statistical inference based on a single sample. (Statistical model. Estimation of mean, variance and cumulative distribution function. Empirical distribution. Quantiles and estimation of quantiles. Confidence intervals for mean, variance and proportion. Hypothesis testing for mean, variance, proportions and distributions.)
3. Statistical inference based on two samples. (Statistical model for paired and unpaired samples. Testing differences between distributions. Independence tests based on contingency tables. Measures of correlation and association. Testing hypothesis about correlation and association. Simple linear regression.)
4. Statistical inference based on more than two samples. (ANOVA. Multivariate regression.)

EXPECTED LEARNING OUTCOMES

No.	LEARNING OUTCOMES
1.	Understand statistical models used for statistical inference.
2.	Understand statistical methods and properties of statistics used for statistical inference.
3.	Demonstrate the ability to analyze data by using models and methods from the course syllabus.
4.	Use computers and appropriate software for data analysis.
5.	Critically study and apply new literature for data analysis.
6.	Understand benefits and limitations of statistical data analysis in applications.
7.	Present results of a statistical analysis to laity and professionals.

COUPLING OF THE EXPECTED LEARNING OUTCOMES, TEACHING PROCESS ORGANIZATION AND THE EVALUATION OF THE TEACHING OUTCOMES

TEACHING PROCESS ORGANIZATION	ECTS	LEARNING OUTCOME **	STUDENT ACTIVITY *	EVALUATION METHOD	SCORE	
					min	max
Attending lectures	1	1-5	Attending lectures, discussions, teamwork and individual work on data	Participant lists, monitoring activities	0	5
Homework	1	1-5	Analysis of data independently	Checking the appropriateness of the statistical methods and models	0	15
Mid-term exam	2	1-6	Preparation for the exam	Checking the correctness of answers and problem solving process (grading)	20	40
Final exam	2	1-7	Preparing and presentation of seminar	Oral exam and discussion with student	20	40
TOTAL	6				50	100

Teaching methods and student assessment.

Attending lectures, exercises and seminars is required. Statistical software if used for exercises (e.g. R). After the completion of lectures, exercises, seminars and a finished seminar work, students take an exam in a written and oral form. Acceptable results achieved in mid-term exams throughout the semester replace the written part of the exam. Students can improve their final grade by actively solving homework problems.

Can the course be taught in English: Yes

Basic literature:

1. M. Benšić, N. Šuvak, *Uvod u vjerojatnost i statistiku*, Sveučilište J.J. Strossmayera, Odjel za matematiku, Osijek, 2014.
2. M. Benšić, N. Šuvak, *Primijenjena statistika*, Sveučilište J.J. Strossmayera, Odjel za matematiku, Osijek, 2013.

Recommended literature:

1. L.J. Kitchens, *Basic Statistics and Data Analysis*, Brooks/Cole, 2002.
2. L.E. Bain, M. Engelhardt, *Introduction to Probability and Mathematical Statistics*, Brooks/Cole, 1992.
3. J.T. McClave, P.G. Benson, T. Sincich, *Statistics for Business and Economics*, Prentice Hall, New York, 2001.
4. G. McPherson, *Applying and Interpreting Statistics, A comprehensive Guide*, Springer, 2001.
5. G.K. Bhattacharyya, R.A. Johnson, *Statistical Concepts and Methods*, Wiley, 1977.
6. Ž. Pauše, *Uvod u matematičku statistiku*, Školska knjiga, Zagreb, 1993.
7. N. Elezović, *Statistika i procesi*, Element, Zagreb, 2007.