Study programmes: Bachelor studies – Mathematics

Course name: M162 – Statistics

Lecturers: Marko Obradović, Bojana Milošević, Lenka Glavaš

Status: Compulsory

ECTS: 6

Attendance prerequisites: M111, M161

Course aims: Learning methods of estimation and testing in statistics.

Course outcome: Upon completing the course, a student has basic knowledge in statistics and is capable of application of the inferential and simulation procedures to real data.

Course content:

Characteristic function and related theorems. Convergence of sequences of random variables. Strong law of large numbers. Central limit theorem. Statistical model. Graphical representation of data. Population, variable, sample. Order statistics. Empirical distribution function. Sample mean and sample variance and their properties. Chi-squared distribution. Joint distribution of sample mean and sample variance in normal case. T-distribution. Other important statistical distributions. Consistency and unbiasedness. Comparison of estimators and Rao-Cramer inequality. MLE method. Confidence interval for p of binomial distribution. Confidence intervals for mean and variance of normal distribution. Hypothesis testing. Rejection region. Level of significance. Power. Inference on parameters of normal distribution. Pearson chi-squared test.

Literature:

1. В. Јевремовић, Ј. Малишић, Статистичке методе у метеорологији и инжењерству, Савезни хидрометеоролошки завод, Београд, 2002.
2. R.J. Larsen, M.L. Marx, An Introduction to Mathematical Statistics and Its Applications, Pearson Education, N. Jersey, 2006.
3. H.Cramer, Mathematical Methods of Statistics, Princeton University Press, Princeton, 1999.

Number of hours: 5	**Lectures: 2**	**Tutorials: 3**	**Laboratory: -**	**Research: -**

Teaching and learning methods: Frontal / Tutorial

Assessment (maximal 100 points)

Course assignments	**points**	**Final exam**	**points**
Lectures	10	Written exam	-
Exercises / Tutorials		Oral exam	-
Colloquia	10	Written-oral exam	70
Essay / Project	10		