Course Unit Descriptor

Study Programme: Information Technology, Engineering Management, Environmental Engineering; Mechanical Engineering

Course Unit Title: Probability and Statistics

Course Unit Code: OAS007

Name of Lecturer(s): Assistant Professor Jelena Stojanov, PhD

Type and Level of Studies: Undergraduate Academic Studies

Course Status (compulsory/elective): Compulsory

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 6

Prerequisites: None

Course Aims: Enabling students for abstract thinking and acquisition of basic knowledge in the field of Probability and Mathematical Statistics. The course objective is to develop special way of thinking in students while studying massive phenomena. The importance is given to application, to the knowledge which can explain quantitative approach of study. The objective is to enable students to choose and apply adequate statistical methods, to do statistical analysis and to essentially elaborate it.

Learning Outcomes: Students are able to use acquired knowledge in further education and in their professions. Students are able to use knowledge about probability and mathematical statistics for modeling wide range of real life problems.

Syllabus:

Theory: Basic notions of Probability: events and axioms of probability. Conditional probability and Bayes formula. Random variable of discrete and continuous type and their distributions. Twodimensional random variable, common distribution and conditional distribution. Transformations of random variables. Mathematical expectation, variance and standard deviation. Moments, covariance and correlation. Large number theorems. Central limit theorems. Basic concepts of statistics, population and sample. Sample distribution, the sample mean and dispersion. Descriptive statistical analysis, data editing, presentation of data, data analysis and software support. Unknown parameters assessment: a point one and an interval rate. Testing hypotheses: parametric and nonparametric. Time series.

Practice: During the lectures adequate examples from theoretical lectures are done, thus practicing the knowledge and contributing to the better understanding of the theoretical knowledge.

Required Reading:

1. Želimir Branović, *Verovatnoća i statistika sa primerima i zadacima*, Tehnički fakultet «Mihajlo Pupin», Zrenjanin, 2003.

2. Milan Merkle, *Verovatnoća i statistika za inženjere i studente tehnike*, Akademska misao, Beograd, 2010.

3. Pavle Mladenović, *Elementaran uvod u verovatnoću i statistiku*, Društvo matematičara Srbije, Beograd, 1998.

4. Mila Stojaković, *Matematička statistika*, Fakultet tehničkih nauka u Novom Sadu, 2000.

5. Silvija Gilezan i dr., *Zbirka rešenih zadataka iz Verovatnoće i Statistike*, Fakultet tehničkih nauka , Novi Sad 2009.

6. W. Mendenhall, R. J. Beaver, B.M. Beaver, *Introduction to Probability and Statistics*, Duxbury Press, 2012.

7. Y. M.Suhov, M.Kelbert, *Probability and Statistics by Example* Volume 1: Basic Probability and Statistics, Cambridge University Press 2005.

Weekly Contact Hours: 4	**Lectures:** 2	**Practical work:** 2
Teaching Methods: Lectures are combined: theoretical part of the course is followed by characteristic examples presented for better understanding of the lectured material. The practice accompanies lectures; typical problems are solved and the knowledge from the lectures is deepened.		
Knowledge Assessment (maximum of 100 points):		

Pre-exam obligations	points	**Final exam**	points
Active class participation	-	written exam	50
Practical work	-	oral exam	20
Preliminary exam(s)	30		