	UNIVERSITY OF EAST SARAJEVO Faculty of Technology Zvornik	
	Study programme: *Chemical Engineering and Technology*	
	Cycle I / Year IV	

Course title	DESIGN AND ANALYSIS OF EXPERIMENTS
Department	Department for Process Engineering – Faculty of Technology Zvornik

Course code	**Course status**	**Semester**	**ECTS**
04-2-055-7	Elective	VII	3

Teacher	Goran Tadić, PhD, Full Professor
Teaching assistant	Nebojša Vasiljević, MsC, Senior Assistant

Number of classes/ teaching workload (per week)			**Individual student workload (in hours per semester)**			**Student workload coefficient S_o**
Lectures	**Auditory exercises**	**Laboratory exercises**	**Lectures**	**Auditory exercises**	**Laboratory exercises**	**S_o**
2	1	0	30	15	0	1.00
2*15 + 1*15 + 0*15 = 45 hours			2*15*1.0 + 1*15*1.0 + 0*15*1.0 = 45 hours			
Total course workload 45 + 45 = 90 hours per semester						

Learning outcomes	After finishing the course, students will be able to: 1. define, use and interpret basic statistical indicators; 2. differentiate and correctly apply statistical techniques and methods of descriptive and inferential statistics for a concrete example; 3. perform a simple statistical analysis of the collected data and correctly interpret the obtained results; 4. use the MINITAB software package for statistical analysis purposes; 5. explain the experimental design methodology; 6. define terms and apply acquired knowledge in the field of regression and correlation.
Prerequisites	No prerequisites
Teaching methods	Lectures, exercises, work in the computer laboratory, seminar paper, mid-term tests (colloquia).
Syllabus outline per week	1. Introduction. Types of data. Types of charts. 2. Getting to know the MINITAB software package. 3. Descriptive statistics. Population (entire set) and sample. Selection of samples. Measures of central tendency. Mean. Median. Mode. 4. Measures of deviation or measures of dispersion (variation). Range. Variance. Standard deviation. Normal distribution. 5. MINITAB commands for determining descriptive statistical parameters. 6. Inferential statistics. Distribution arithmetic means of a sample (sampling distribution). Central limit theorem. Confidence intervals for the arithmetic mean of the population. 7. Concept of hypothesis testing. 8. Design of experiment (DoE). Defining the experiment. Some typical applications of experimental design. 9. Identification of variables and responses. Types of variables. Types of response. Interactions. 10. Types of experiments. Types of models. Selection of variable levels. Nested variables. 11. Types of experimental design (full factorial design, fractional factorial design, etc.). Randomization (random selection). Replication and repetition. Blocking. 12. Description of the general procedure for performing the experiment design. 13. Linear regression. Regression coefficient. Correlation. Coefficient of determination. Correlation coefficient. 14. MINITAB functions for performing linear regression. 15. Transformation into linear forms. Polynomial models. Mid-term tests are taken after the 8th week and the 15th week. Semester verification is required after the 15th week.

Obligatory reading			
Author	**Title, publisher**	**Year**	**Pages**

Mathews, P.G.	Design of Experiments with MINITAB, ASQ Quality Press, Milwaukee,Wisconsin	2004	1-141; 273-308
Additional reading			
Author	**Title, publisher**	**Year**	**Pages**
Montgomery, D.C.	Design and Analysis of Experiments, John Wiley&Sons, Inc.	2013	1-681
Serdar, V.	Textbook of Statistics, School book, Zagreb	1977	1-384

Obligations, assessment methods and grading system	**Type of student evaluation**	**Grade points**	**Percentage**
	Pre-exam obligations		
	Attendance	6	6 %
	Seminar paper	14	14 %
	Mid-term test (Colloquium) 1	25	25%
	Mid-term test (Colloquium) 2	25	25%
	Final examination		
	Final examination (oral)	30	30 %
	Total	100	100 %
Web page	www.tfzv.ues.rs.ba		
Date	2023		