EXPERIMENT DESIGN AND DATA ANALYSIS IN ENGINEERING

1	Course Title:	EXPERIMENT DESIGN AND DATA ANALYSIS IN ENGINEERING	
2	Course Code:	OTO5171	
3	Type of Course:	Optional	
4	Level of Course:	Third Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:		
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Dr. Ögr. Üyesi HAKKI ÖZER	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	hakkiozer@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	With this course, students can have a basic knowledge of statistics and statistical analysis and the ability to analyze data obtained as a result of scientific research using a statistical package program.	
19	Contribution of the Course to Professional Development:	Students will gain optimum experiment and analysis knowledge as a result of this course.	
20	Learning Outcomes:		
		1	May have a general knowledge of statistics and statistical analysis.
		2	Can enter and edit data in statistical package programs.
		3	Can analyze the data obtained as a result of a scientific research using a statistical package program, and can prepare and interpret the models, tables and graphs obtained through statistical analysis.
		4	Can perform experimental design, statistical analysis, single-criteria optimization and interpret analysis and optimization results using statistical package programs.
		5	Can select appropriate research methods and data collection tools for engineering research and applications, prepare them, design experiments, and perform statistical analysis and evaluation of data.
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21	Course Content:		
	Course Content:		
Week	Theoretical		Practice

1	Introduction to scientific research methods and techniques. Basic statistical terms (Population, sample, variable, parameter, experiment, data, etc.). Data collecting. Data collection tools. Determining the most appropriate data collection tool.	
2	Experimental design. Experimental design with the classical method. Experimental design with statistical method. Statistical package programs, menus of the statistical package program, data entry. Editing, changing (recoding and calculating etc.) variables.	
3	Regression. Curve Fitting. Mathematical and Predictive Modeling.	
4	Variance Analysis.	
5	Full factorial experimental design.	
6	Full Factorial experimental design applications supported by statistical packages in engineering and scientific research.	
7	Experimental design with Response Surface Method.	
8	Response Surface Method experimental design applications supported by statistical package programs in engineering and scientific research.	
9	Experimental design with Mixture Design	
12	Taguchi experimental design method	
14	Graphics. Creating appropriate and different	
22	Textbooks, References and/or Other	1. Akgül, A. (2003). Tıbbi araştırmalarda istatistiksel analiz 2. Joaquim P. Marques de Sa, (2007), Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer Olmayan Yöntemler-SPSS Uygulamalı, Gazi Kitabevi 4. Landau, S. And Everit, B.S., (2004), A Handbook of Statistical Analysis Using SPSS,Chapman&Hall/CRC. 5. Özdamar, K., (2013), Paket Programlar ile İstatistiksel Veri Analizi, Çok Değişkenli Analizler, Seçkin Kitabevi. 6. Runyon, R.P., Coleman, K.A., Pittenger. D.j., (2000), Fundementals of Behavioral Statistics, 9th Edition, McGraw Hill. 7. Motorcu, A.R. (2023). Lecture notes. 8. Internet Research.
23	Assesment	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preparation	13	2.00	26.00
Homeworks	1	60.00	60.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	5.00	5.00
Others	0	0.00	0.00
Final Exams	1	50.00	50.00
Total Work Load			188.00
Total work load/ 30 hr			6.10
ECTS Credit of the Course			6.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	30.00
Quiz	0	0.00

Home work-project	1	10.00
Final Exam	1	60.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Measurement and evaluation is carried out according to the priciples of Bursa uludag University Associate and Postgraduate Education Regulation.

24	**ECTS / WORK LOAD TABLE**

25	**CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	1	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**		**3 Medium**		**4 High**			**5 Very High**						