MAT204 – PROBABILITY AND STATISTICS

Course Code	Course Name		Semester	
MAT204	Probability and Statistics		Fall ☐ Spring ☒	
Course Hours			Course Hours	Credit
Theory	Application	Laboratory	3	5
3	-	-		

Course Details	
Department	Software Engineering
Course Language	English
Course Level	Bachelor's Degree ☒ Master's Degree ☐
Education Type	Formal Education ☒ Distance ☐ Hybrid ☐
Course Type	Compulsory ☒ Elective ☐
Course Objectives	To teach engineering students the necessary probability and statistical techniques, to be able to interpret the results of statistical analysis and to make correct statistical decisions.
Course Content	Application of basic concepts in probability and statistics with engineering. Topics: descriptive and inferential statistics, probability, discrete and continuous random variables, confidence interval estimation, regression and correlation, analysis of variance.
Course Methods and Techniques	Lecture ☒ Question-Answer ☒ Presentation ☐ Discussion ☐
Prerequisites	Math
Workplace Status	-

Recommended Books

- Ersöz, F., Ersöz T. (2022), İstatistik I- II, Seçkin yayınevi, Ankara
- Ersöz, F., Ersöz T. (2019), SPSS ile İstatistiksel Veri Analizi, Ankara
- Lawrence L. Lapin (1990), Probability and Statistics for Modern Engineering, PWS-Kent Pub. Co. edition, in English - 2nd ed.

Course Structure				
Mathematics and Basic Sciences	☒		Education Sciences	☐
Engineering Sciences	☐		Science	☒
Engineering Design	☐		Health Sciences	☐
Social Sciences	☐		Field Knowledge	☐

Weekly Schedule	
No	**Topics**
1	Introduction to Statistics: History, Subject, Classification, Stages and Statistical Definitions and Concepts
2	Distributions and Classification: Frequency and Cumulative Frequency Distributions
3	Measures of Central Tendency
4	Measures of Central Dispersion
5	Random Variables and Probability Distributions; Conditional Probability and Bayes Theorem
6	Discrete Probability Distributions (Binomial, Poisson, Hypergeometric)
7	Normal Distribution
8	Midterm Exam
9	Sampling Theory
10	Statistical Forecasting Theory
11	Confidence Interval and Confidence Limits
12	Statistical Decision Theory (Hypothesis Testing)
13	Regression and Correlation Analysis
14	One-Way Analysis of Variance (ANOVA)
15	Two-Way Analysis of Variance
16	General Exam

Evaluation Criteria		
Semester Studies	**Number**	**Contribution Share**
Attendance	1	5
Laboratory		
Application		
Fieldwork		
Course Specific Workplace Training		
Quizzes/Studio/Critical		
Homework	3	20 (10+5+5)
Presentation		
Projects		
Report		
Seminar		
Midterm Exams/Midterm Jury	1	25
General Examination/Final Jury/Delivery	1	50
	Total	**%100**
Contribution of Semester Studies to Success Grade		
Contribution of End of Semester Studies to Success Grade		
	Total	**%100**

ECTS/ Workload Table			
Activities	**Number**	**Duration (Hour)**	**Total Workload**
Course Hours	14	3	42
Laboratory			
Application			
Fieldwork			
Course Specific Workplace Training			
Out of Class Study Time	14	3	42
Quizzes/Studio/Critical			
Homework			
Presentation / Seminar Preparation			
Projects			
Report			
Midterm and Midterm Exam Preparation	1	10	10
General Examination and General Examination Preparation	1	20	20
Total Workload			**114**
Total Workload / 25			**4,56**
ECTS Credit			**5**

Course Learning Outcomes	
No	**Description**
Ö1	Define the basic concepts of probability and statistics.
Ö2	Calculate types of probability, independent events, Bayes theorem and conditional probability.
Ö3	Summarize and interpret engineering problems using descriptive statistics.
Ö4	Solve engineering problems with inferential statistics (hypothesis testing).
Ö5	Solve and interpret statistical problems using computers, in addition to the ability to calculate with formulas to solve engineering problems.

Contribution of Course Learning Outcomes to Program Learning Outcomes

Contribution Level: 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**	**Total**
Ö1	5	5	5	5	5	2	4	4	3	1	1	1	1	1	3	46
Ö2	5	5	5	5	5	2	4	4	3	1	1	1	1	1	2	45
Ö3	5	5	5	4	3	2	2	2	4	1	1	1	1	1	3	40
Ö4	5	5	5	4	4	2	3	2	4	1	1	1	1	1	3	42
Ö5	5	5	5	5	4	2	4	1	2	1	1	1	1	1	3	41
														Total		214