OSTIM TECHNICAL UNIVERSITY
FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES
ECONOMICS DEPARTMENT
COURSE SYLLABUS FORM
2022-2023 SPRING

ECON 203 Statistics I							
Course Name	**Course Code**	**Period**	**Hours**	**Application**	**Laboratory**	**Credit**	**ECTS**
Statistics II	ECON 204	4	2	1	-	3	5

Language of Instruction	English
Course Status	Compulsory
Course Level	Bachelor
Learning and Teaching Techniques of the Course	Lecture, Question-Answer, Problem Solving
Class Time/Classroom	
Instructor	Dr. Busra Agan
Office	
E-mail	
Office Hours	
Teaching Assistants	

Course Objective

This course follows on from Statistics I and broadens the knowledge and application of several statistical methods. It covers subjects such as hypothesis testing and estimation for means, proportions, and variances; simple and multiple regressions; applications of Chi-square distribution; analysis of variance; linear correlation and regression; non-parametric statistics; and quality management. Moreover, this course intends to teach basic rules of Statistics Science combined with statistical empirical examples related to the economics and managerial sciences by using R, Jamovi, JASP, E-Views, SPSS, and Microsoft Office Excel programs.

Learning Outcomes

Student, who passed the course satisfactorily will be able:

1- to describe basic procedures to construct a confidence interval and perform a hypothesis test
2- to estimate statistical parameters in one variable and two variables
3- to perform hypothesis tests of statistical parameters in one variable and two variables.
4- to choose the appropriate statistical analysis for a given situation.
5- to perform nonparametric tests for various applications.
6- to perform chi-square tests for various applications and use the quality control tools.
7- to use R, Jamovi, JASP, E-Views and SPSS software to perform various statistical procedures.

Course Outline
This course deals with knowledge of one- and two-sample hypothesis tests and simple and multiple regression models. It also covers in detail all aspects of the analysis of variance, aspects of the Chi-Square test, correlation, and time series analysis, as well as introducing students to the fundamental non-parametric tests and quality management approach.

Weekly Topics and Related Preparation Studies		
Weeks	**Topics**	**Preparation Studies**
1	One-Sample Hypothesis Tests (Doane and Seward, Chapter: 9, Practice in R, Jamovi, JASP, E-Views)	– Logic of Hypothesis Testing – Type I and Type II Error – Decision Rules and Critical Values – Testing a Mean: Known Population Variance – Testing a Mean: Unknown Population Variance
2	Two-Sample Hypothesis Tests (Doane and Seward, Chapter: 10, Practice in R, Jamovi, JASP, E-Views)	– Two-Sample Tests – Comparing Two Means: Independent Samples – Confidence Interval for the Difference of Two Means – Comparing Two Means: Paired Samples
3	Analysis of Variance (Doane and Seward, Chapter: 11, Practice in R, Jamovi, JASP, E-Views)	– Overview of Anova – One-Factor Anova – Multiple Comparisons – Tests for Homogeneity of Variances – Two-Factor Anova without Replication
4-5	Simple Regression (Doane and Seward, Chapter: 12, Practice in R, E-Views, SPSS)	– Visual Displays and Correlation Analysis – Regression Models – Ordinary Least Squares Formulas – Tests for Significance – Analysis of Variance: Overall Fit – Residual Tests
6-7	Multiple Regression (Doane and Seward, Chapter: 13, Practice in R, E-Views, SPSS)	– Multiple Regression – Assessing Overall Fit – Predictor Significance – Confidence Intervals for Y – Categorical Predictors – Tests for Nonlinearity and Interaction – Multi collinearity – Regression Diagnostics

8	**MIDTERM EXAM**	
9-10	Time-Series Analysis (Doane and Seward, Chapter: 14, Practice in R, Jamovi, E-Views)	– Time-Series Components – Trend Forecasting – Assessing Fit – Moving Averages – Exponential Smoothing – Seasonality
11-12	Chi-Square Tests (Doane and Seward, Chapter: 15, Practice in R, Jamovi, E-Views)	– Chi-Square Test for Independence – Chi-Square Tests for Goodness-of-Fit – Uniform Goodness-of-Fit Test – Poisson Goodness-of-Fit Test – Normal Chi-Square Goodness-of-Fit Test
13	Nonparametric Tests (Doane and Seward, Chapter: 16, Practice in R, Jamovi, E-Views)	– Why Use Nonparametric Tests? – One-Sample Runs Test – Wilcoxon Signed-Rank Test – Wilcoxon Rank Sum Test – Kruskal-Wallis Test for Independent Samples – Friedman Test for Related Samples – Spearman Rank Correlation Test
14	Quality Management (Doane and Seward, Chapter: 17, Practice in R, Jamovi)	– Quality and Variation – Pioneers in Quality Management – Quality Improvement – Control Charts: Overview – Control Charts for a Mean – Control Charts for a Range
15	Review Lecture	–
16	**FINAL EXAM**	

Textbook(s)/References/Materials:
Textbook: David P. Doane and Lori E. Seward, Applied Statistics in Business and Economics, Publisher: Mc Graw-Hill Education, 7th Edition, 2022.
Supplementary References: Robert M. Leekley, Applied Statistics for Business and Economics, Publisher: Taylor & Francis Group, 2020.

Assessment		
Studies	**Number**	**Contribution margin (%)**
Attendance		
Lab		
Class participation and performance	**1**	**10**
Field Study		
Course-Specific Internship (if any)		
Quizzes / Studio / Critical		
Homework	**1**	**15**
Presentation		
Projects		
Report		
Seminar		
Midterm Exam/Midterm Jury	**1**	**25**
General Exam / Final Jury	**1**	**50**
Total		**100**
Success Grade Contribution of Semester Studies		**50**
Success Grade Contribution of End of Term		**50**
Total		**100**

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Course hours (Including the exam week): 16 x total course hours)	16	2	32
Laboratory			
Application	16	1	16
Course-Specific Internship (if any)			
Field Study			
Study Time Out of Class	16	3	48
Presentation / Seminar Preparation			
Projects			
Reports			
Homework	1	8	8
Quizzes / Studio Review			
Preparation Time for Midterm Exams / Midterm Jury	1	25	25
Preparation Period for the Final Exam / General Jury	1	30	30
Total Workload	**(159/30 = 5,30)**		**159**

Course' Contribution Level to Learning Outcomes						
Nu	**Learning Outcomes**	**Contribution Level**				
		1	**2**	**3**	**4**	**5**
LO1	to describe basic procedures to construct a confidence interval and perform a hypothesis test					X
LO2	to estimate statistical parameters in one variable and two variables					X
LO3	to perform hypothesis tests of statistical parameters in one variable and two variables.					X
LO4	to choose the appropriate statistical analysis for a given situation.					X
LO5	to perform nonparametric tests for various applications.					X
LO6	to perform chi-square tests for various applications.					X
LO7	to use Jamovi, JASP, SPSS software to perform various statistical procedures.					X

Relationship Between Course Learning Outcomes and Program Competencies (Department of Economics)								
Nu	**Program Competencies**	**Learning Outcomes**						**Total Effect (1-5)**
		LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**
1	Know the basic concepts used in economics, the relations between concepts, economic theories, the functioning mechanisms of the economy and the development processes of economies over time.	x						1
2	Know how to obtain economic data and the research methods for processing and evaluating the obtained data by using various computer programs when necessary.							x 4
3	Follow current developments in national and international macroeconomic conjuncture and world economic relations and can suggest economic policies to be used in case of economic problems.							
4	Acquire the capacity to conduct individual research on the field, interpret the results, and compare them with theoretical propositions.		x	x				4
5	Scrutinize and interpret all kinds of knowledge in the field of economics, including theoretical and statistical information, through analysis within the framework of cause-effect					x	x	1

	relationships.								
6	Present solutions and opinions about the problems analyzed by supporting them with qualitative and quantitative data, use an analytical language, and support the used approach with visual and graphical materials.	x						x	4
7	Gain advanced skills in software and programming languages that assist analysis in the econometric field and can adapt to new software and programming languages							x	4
8	Support the acquired theoretical knowledge of economics with econometric and statistical calculations, analyze and evaluate phenomenon using software and programming languages within the framework of analytical thinking.				x				4
9	Develop the ability to analyze unexpected and complex problems to be encountered during professional practice, can take responsibility as an individual or team member for solving the problem, and take initiative when necessary.								
10	Develop critical thinking and produce solutions on policy issues by adapting the theoretical and analytical knowledge to different conceptual frameworks.								
11	Exhibit approaches that will adapt to the speed of globalization, innovations and technological developments.								
12	Having an entrepreneurial spirit, develop original and innovative ideas, solution proposals and assume responsibility.								
13	Pay maximum attention to social responsibilities, ethical sensitivities and legal framework in theoretical and practical studies.								
14	Communicate with peers, colleagues, co-workers, employees and managers with common sense, empathy and situational awareness.								
15	Communicate effectively with colleagues, senior managers and the market, both in mother tongue and in at least one foreign language (English).								
Total Effect									22

Policies and Procedures
Web page: .....
Exams: The exams aim at assessing knowledge of basic concepts and theories of statistics and improving the students' ability to do empirical statistical data analysis. Exams are composed of a final exam comprising 50 % of the student's grade and a 25 % mid-term exam. The rest of the grade comes from class performance and homework, shown in the assessment table included in this syllabus. The Department of Economics does not tolerate any act of academic dishonesty. Examinations are individual and must be completed without any outside assistance. Students who attempt to cheat during exams will receive a failing grade from that exam. The case could also be carried to the Dean's Office for additional disciplinary action.
Assignments: The assignments could be in form of Homework or Projects containing empirical statistical analysis of economic data and interpretation of the statistical outputs. Such an exam could be in the form of paper writing. A paper must include 1- Abstract 2- Introduction, 3- Literature review 4- Research Method, 5- Findings and Discussion 6- Conclusion. Scientific Research Ethic Rules are very important while preparing assignments. The students should be careful about citing any material used from outside sources and reference them appropriately. The students must not adopt "cut-copy-paste" behavior from the sources in the internet or use the contents of any type of previous work in their assignments. Plagiarism is unethical behavior and is subject to disciplinary action.
Missed exams: Any student missing an exam needs to bring an official medical report to be able to take a make-up exam.
Attendance: Attendance requirements are announced at the beginning of the term. Students are usually expected to attend at least 70% of the classes during each term.
Objections: If the student observes a material error in his/her grade, he/she has the right to place an objection to the Faculty or the Department. The claim is examined and the student is notified about its outcome.