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

ECON 105 Research Methods with Computer Applications I							
Course Name	**Course Code**	**Period**	**Hours**	**Application**	**Laboratory**	**Credit**	**ECTS**
Research Methods with Computer Applications I	ECON 105	1	2	1	0	3	4

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	Asst.Prof. Dr. Melike Aktaş Bozkurt
Office	9th Floor- 913
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Office Hours	09:00-12:00 on Tuesdays and by e-mail
Teaching Assistants	Huzeyfe Erkam Candan (huzeyfe.candan@ostimteknik.edu.tr) Office Hours: By e-mail

Course Objective

The course aims at introducing the basic concepts used in research and scientific social research methods and their approaches. It presents fundamental and advanced concepts in statistics and probability and shows how to effectively collect, analyze, and draw inferences from data in order to answer a research question and understand the analyses by others. The emphasis will be placed on statistical reasoning, problem solving, computer applications, and interpretation of the results.

Learning Outcomes

The students who become successful in this course will be able;

- to learn how to develop and investigate a research question in economics and other social sciences.
- to know basic research methods in economics and other social sciences.
- to have knowledge about data analysis with Excel, R and Gretl.
- to master the basic concepts of statistics and be familiar with descriptive statistical analysis.
- to evaluate and enhance data for effective economic analysis

Course Outline
This course includes discussions on sampling techniques, research designs and techniques of analysis. The course also introduces statistical reasoning, emphasizing how Statistics can help us understand the world. Topics include numerical and graphical summaries of data, visualization of the data, data acquisition and experimental design, probability, hypothesis testing, confidence intervals, correlation and regression. Students will learn to apply statistical concepts to data and reach conclusions about real-world problems with the applications of Excel, R and Gretl.

Weekly Topics and Related Preparation Studies		
Weeks	**Topics**	**Preparation Studies**
1	Introduction, Basic Concepts of Research Methodology	– Research Process and Design – Research Problem – Variables and Their Types – Formulation of Hypothesis – Sampling – Tools of Data Collection – Data Analysis – Interpretation of Data – Research Methods – Descriptive or Survey Method – Experimental Method – Research Proposal – Research Report
2	Description and Inference, Statistical Computing (Agresti, Chap.1)	– Introduction to Statistical Methodology – Descriptive Statistics and Inferential Statistics – The Role of Computers and Software in Statistics
3	Sampling and Measurement, Descriptive and Graphical Methods (Agresti, Chap.2)	–Variables and Their Measurement –Randomization –Sampling Variability and Potential Bias –Other Probability Sampling Methods –and Population Parameters
4	Sampling and Measurement, Descriptive and Graphical Methods (Agresti, Chap.3)	–Describing Data with Tables and Graphs –Describing the Center of the Data –Describing Variability of the Data –Measures of Position –Bivariate Descriptive Statistics –Sample Statistics

5	Probability Distributions and Sampling Distributions (Agresti, Chap.4)	–Introduction to Probability –Probability Distributions for Discrete and Continuous Variables –The Normal Probability Distribution –Sampling Distributions Describe How Statistics Vary –Sampling Distributions of Sample Means –Review: Population, Sample Data, and Sampling Distributions
6	Point Estimation and Interval Estimation for a Mean and Proportion (Agresti, Chap.5)	–Point and Interval Estimation –Confidence Interval for a Proportion –Confidence Interval for a Mean –Choice of Sample Size –Estimation Methods: Maximum Likelihood and the Bootstrap
7	Review	–Problem solving session
8	**MIDTERM EXAM**	
9	Significance Tests for Means and Proportions (Agresti, Chap.6)	–The Five Parts of a Significance Test –Significance Test for a Mean –Significance Test for a Proportion –Decisions and Types of Errors in Tests –Limitations of Significance Tests –Small-Sample Test for a Proportion—The Binomial Distribution
10	Comparing Two Groups (Means and Proportions) (Agresti, Chap.7)	–Preliminaries for Comparing Groups –Categorical Data: Comparing Two Proportions –Quantitative Data: Comparing Two Means –Comparing Means with Dependent Samples –Other Methods for Comparing Means –Other Methods for Comparing Proportions
11	Categorical Data Analysis (Agresti, Chap.8)	–Contingency Tables –Chi-Squared Test of Independence –Residuals: Detecting the Pattern of Association –Measuring Association in Contingency Tables –Association Between Ordinal Variables
12	Simple Linear Regression and Correlation (Agresti, Chap.9)	–Linear Relationships –Least Squares Prediction Equation –The Linear Regression Model –Measuring Linear Association: The

		Correlation –Inferences for the Slope and Correlation –Model Assumptions and Violations
13	Basics in Creating Web Page	–Introduction to HTML
14	Basics in Creating Web Page	–Introduction to CSS
15	Review	–Problem solving session
16	**FINAL EXAM**	

Textbook(s)/References/Materials:
Textbook: Agresti, A. (2018). Statistical methods for the social sciences. Pearson.
Supplementary References:
Other Materials: -

Assessment		
Studies	**Number**	**Contribution margin (%)**
Attendance		
Lab		
Class participation and performance	**1**	**10**
Field Study		
Course-Specific Internship (if any)		
Quizzes / Studio / Critical		
Homework		
Presentation		
Projects	**1**	**10**
Report		
Seminar		
Midterm Exam/Midterm Jury	**1**	**30**
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	3	48
Laboratory			
Application			
Course-Specific Internship (if any)			
Field Study			
Study Time Out of Class	10	3	30
Presentation / Seminar Preparation			
Projects	1	10	10
Reports			
Homework			
Quizzes / Studio Review			
Preparation Time for Midterm Exams / Midterm Jury	1	16	16
Preparation Period for the Final Exam / General Jury	1	16	16
Total Workload	**(120/30 =4)**		**120**

Course' Contribution Level to Learning Outcomes							
Nu	**Learning Outcomes**	**Contribution Level**					
		1	**2**	**3**	**4**	**5**
LO1	to learn how to develop and investigate a research question in economics and other social sciences.					X
LO2	to know basic research methods in economics and other social sciences.					X
LO3	to have knowledge about data analysis with Excel, R and Gretl.					X
LO4	to master the basic concepts of statistics and be familiar with descriptive statistical analysis.					X
LO5	to evaluate and enhance data for effective economic analysis					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**	
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.						
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		x		x	5

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				5
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 relationships.	x			x		5
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		x	5
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	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		x	x		5
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.	x					3
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							32

Policies and Procedures
Web page: https://www.ostimteknik.edu.tr/economics-752
Exams: The exams aim at assessing various dimensions of learning: knowledge of concepts and theories and the ability to apply this knowledge to real world phenomenon, through analyzing the situation, distinguishing problems and by suggesting solutions. The written exams can be of two types, i.e., open-ended questions, which can also be in the form of problems or multiple-choice questions. Exams are composed of a final exam comprising 50% of the student's grade and a mid-term exam, with less weight. The rest of the grade comes from other assessment methods, 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 (if any) could be in the form of Homework or 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.
Projects: The projects (if are a part of the course requirements) could be performed either individually or in groups, without engaging in plagiarism
Attendance: Attendance requirements are announced at the beginning of the term. Student 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.