Syllabus(tentative)	Subject	MGT 800: Applied Business Statistics - 3KU/6ECTS
	Department	Economics and Management
	Program	Graduate
	Term	Fall 2022
	Instructor	Rovshan Hajiyev
	E-mail	rovhsan.hajiyev@khazar.org
	Classroom/hours	Bashir Safaroglu 122, Room
Language	English	
Compulsory/Elective	Compulsory	
Textbooks and course materials	*Core Textbooks:* *[1]* Applied statistics in business and economics. 5th edition. By David P Doane, Lori Welte Seward Year: 2016 Publisher: Mcgraw-Hill Education Publisher Place: New York, Ny ISBN: 9780077837303 *Supplementary reading materials:* *[2]* Statistics for Business & Economics. 14th edition. By David R Anderson Year: 2019 Publisher: Cengage Learning Publisher Place: New York ISBN: 9781337901062 *[3]* The practice of statistics for business and economics. 4th edition. By David S. Moore, George P. McCabe, Layth C. Alwan, Bruce A.Craig Year: 2016 Publisher: W.H. Freeman and Company Publisher Place: New York ISBN: 9781464132261	
Course outline	Business and economics applications are used to illustrate these concepts. This course has a business focus. The course covers fundamentals of descriptive and inferential statistical techniques. Business and economics applications are used to illustrate these concepts. The contents include data summaries and descriptive statistics; introduction to a statistical computer package; Probability: distributions, expectation, variance, covariance, statistical inference of univariate and bivariate data for hypothesis testing and regression estimation. The aim of the course is to develop competency and ability to use statistical techniques in conducting research and project work. The emphasis of the course is more on interpretation of results and understanding of the strengths and limitations of different statistical measures. It is impossible to solve the tasks of economy and management without convenient statistical data and without using statistical methods of processing these data. Thus, explaining the current situation and looking into the future requires the application of various statistical methods. Data collection and analysis has proven to be an important tool in making relevant decisions. The main task of business statistics is to analyze the data and give justified conclusions. Applied business statistics teaches step-by-step application of statistics using real situations and data. After successful completion of the course students will be able to summarize and analyze statistical data to solve practical business-related problems. Students are going to interpret the relevance of statistical findings for business problem solving and decision making. As well as to apply technology to statistical analysis and problem solving.	
Course objectives	Distinguish among different scales of measurement and their implications for solving problems. Create tables and graphs to format, organize, and interpret data; summarize and present data. Calculate and analyze numerical descriptive measures for a given data set. Apply concepts of sample space and probability to solving problems. Calculate measures of central tendency and variation; use statistical software to analyze results Calculate the probability that an event will occur Identify methods of obtaining data and identify the advantages and disadvantages of each as applied to solving problems Calculate the mean and variance of a discrete distribution. Calculate probabilities using normal and t-distributions Distinguish between sample and population distributions, analyze the role played by the central limit theorem, and apply the central limit theorem to calculate standard error and determine the sampling distributions Construct and interpret confidence intervals. Identify the basic concepts of hypothesis testing; distinguish between Type I and Type II errors; conduct hypothesis testing for population mean. Apply linear regression analysis for estimation and inference; interpret resulting data. Determine and interpret statistical significance, including p-values. Model and solve statistics problems using Microsoft Excel	

	and its Data Analysis Toolach Use statistical techniques to analyze and interpret data from business, social science, and science		
Learning Outcomes	Having completed the course students will be able to: ● Understand basic properties of data sets and their graphs ● Describe basic traits of data and show the associations between categorical and quantitative variables ● Understand and apply probability concepts into business areas ● Construct confidence intervals and run significance tests about hypothesis ● Work with basic applications and software of statistics (Excel)		

Teaching methods	Case analysis	X
	Lecture	X
	Problem Solving	X

Evaluation Criteria	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Activity		5
	Attendance		5
	Project		10
	Final Exam		40
	Quizzes		10
	Total		100

Policy	**Activity/Attendance.** Because of the once-a-week course format, students are expected to attend all sessions. If you have an absence, take responsibility for making up assignments and for obtaining missed lecture information. Participation is important for doing well in the course. You'll be graded for your active engagement with the material and your peers. The activity and participation will account for 10 % of the total course grade. **Class preparation:** Students are responsible for: 1) reading the assigned materials; 2) taking the initiative to ask questions that promote understanding of the academic subject; 3) communicating regularly with the instructor, especially in matters related to class assignments. **Quizzes:** The structure and format of the homework may include multiple choice and open-ended questions. Analysis of the assigned case will be conducted by each student. Homework and case analysis will account for 20 % of the final grade. **Project:** The purpose of this assignment is to test your ability to 1) locate, 2) select and 3) analyze data. This assignment is based on a situation that you may encounter in a corporate scenario. This purpose is aligned with desirable graduate attributes as part of the learning outcomes associated with Statistics for Business and Economics. **Cheating/Plagiarism.** Academic integrity is fundamental to the activities and principles of a university. Breaches of the academic integrity will lead to assignment cancellation. When in doubt about plagiarism or any other form of cheating, consult the course instructor

Tentative Schedule			
Week	**Date (tentative)**	**Topics**	**Textbook/Assignments**
1		**Using Graphs to Describe Data:** Introduction to Business Analytics Level of measurement Time series versus cross-sectional data Data Descriptions Sampling Concepts and Methods Business Analytics in Practice	Ch2 [page. 23-50]
2		**Statistical grouping:** Signs and types of statistical groupings Width of the intervals. Sturge's rule. 2^k Rule Data Description	Ch3 [page. 65-95]

		Numerical applications in Business Analytics	
3		**Descriptive Statistics:** Numerical Description Central Tendency Standardized Data Percentiles Quartiles and Box Plot Numerical Applications in Business Analytics	Ch4 [page. 113-154]
4		**Probability:** **Quiz 1** Random Experiments Counting Rules Independent Events Conditional Probability	Ch5 [page 172-188]
5		**Probability:** Bayes Theorem Tree Diagrams Decision Making in Business Analytics	Ch5 [page 196-207]
6		**Discrete Probability Distributions:** Normal Distribution Uniform Distribution Binomial Distribution Standard Normal Distribution Empirical Approaches	Ch6 [page 215-232]
7		**Sampling Distribution and Estimation:** Confidence Interval for a mean with known sigma Confidence Interval for a mean with unknown sigma Confidence Interval for a proportion Applications in Business Analytics **Mid-term exam review and discussion:**	Ch7 [page 295-318]
8		**One - Sample Hypothesis Test:** **Mid-term Exam** Logic of Hypothesis Testing Testing a mean known population variance Testing a mean unknown population variance Testing a proportion Business applications	Ch9 [page 341-381]
9		**Two - Sample Hypothesis Test:** Comparing Two Means: Independent Samples Confidence Interval for the Difference of Two Means Comparing Two Means: Paired Samples Comparing Two Proportions Confidence Interval for the Difference of Two Proportions Comparing two variances	Ch10 [page 391-417]
10		**Analysis of Variance: 1** Overview of ANOVA One-Factor ANOVA (Completely Randomized Model)	Ch11 [page 439-464]
11		**Analysis of Variance: 2** Tests for Homogeneity of Variances Two-Factor ANOVA without replication Empirical Applications	Ch12 [page 49-510]
12		**Simple Regression: 1** **Quiz 2** Visual Displays and Correlation Analysis	Ch12 [page 511-524]

		Simple Regression	
		Ordinary Least Squares Formulas Tests for significances	
13		**Simple Regression: 2**	Ch14
		Analysis of Variance Overall Fit	
		Residual Tests	[page 595-627]
		Linear Regression Forecasting	
14		**Chi-Square Tests:**	Ch15
		Chi-Square Test for Independence	
		Chi-Square Tests for Goodness-of-Fit	[page 643-665]
		Uniform Goodness-of-Fit Test	
		Poisson Goodness-of-Fit Test	
		Normal Chi-Square Goodness-of-Fit Test	
15		**Non-Parametric Tests:**	Ch16
		Why Use Nonparametric Tests?	
		One-Sample Runs Test	[page 685-695]
		Wilcoxon Signed-Rank Test	
		Mann-Whitney Test	
		Kruskal-Wallis Test for Independent Samples	
		Final exam review and discussion:	
		Final exam	