Course Name : Probability and Statistics

Course Code	Course Type	Regular Semester	Lecture (hours/week)	Seminar (hours/week)	Lab. (hours/week)	Credits	ECTS
CMP 227	B	Fall	3.00	0.00	1.00	3.50	5.00

Lecturer	Kriselda Gura, MSc
Assistant	
Course language	Albanian
Course level	Bachelor
Description	The aim of the course Probability and Statistics is to provide students with the necessary knowledge about the basic concepts of statistics and probability. In this course there is a combination of theoretical aspects with the practical aspect, increasing the ability of students for an efficient use of statistical analysis. The program is explained through units dealing with basic knowledge on: statistical data, density distribution, localization and variation indicators, variance, linear regression, correlation analysis, probability, etc.
Objectives	The major objective of this course is to increase the student data analysis skills using different statistical tools, both from descriptive and inferential statistics. The objective of the course is to help students to understand theoretical characteristics of statistical methods and develop practical knowledge and skills to analyze the business data.
Core Concepts	1. Variable - A variable is a characteristic or attribute that can assume different values. 2. Population - A population consists of all subjects (human or otherwise) that are being studied 3. Inferential statistics - Inferential statistics consists of generalizing from samples to populations, performing estimations and hypothesis tests, determining relationships among variables, and making predictions. 4. Frequency distribution - A frequency distribution is the organization of raw data in table form, using classes and frequencies. 5. Parameter - A parameter is a characteristic or measure obtained by using all the data values from a specific population. 6. Probability experiment - A probability experiment is a chance process that leads to well-defined results called outcomes. An outcome is the result of a single trial of a probability experiment. 7. Histogram - Histogram a graph that displays the data by using vertical bars of various heights to represent the frequencies of a distribution 8. Random variable - A random variable is a variable whose values are determined by chance. 9. Normal distribution- If a random variable has a probability distribution whose graph is continuous, bellshaped, and symmetric, it is called a normal distribution. The graph is called a normal distribution curve

Course Outline

Week	Topic
1	Topic: Introduction to Statistics. In this topic students will be introduced to the subject of statistics with basic concepts: what is statistics, the importance of statistics, descriptive and inferential statistics. (Pyrczak, 2004; Chapter 1, pp. 9-23)
2	Topic: Introduction to Statistics (continued). In this topic students will be introduced to the basic concepts of statistics: data, variables, percentages, different types of distributions, etc. (Pyrczak, 2004; Chapter 1, pp. 23-53)
3	Topic: Descriptive statistics. In this topic students will be introduced to tabular and graphical methods of data processing, qualitative and quantitative data, density distribution, statistical graphs, their meaning and importance (Pyrczak, 2004; Chapter. 2, pp. 53-99)
4	Topic: Descriptive statistics (continued). In this topic students will be introduced to localization indicators: average, median, fashion, etc. (Pyrczak, 2004; Chapter 3, pp. 99-117)

5	Topic: Descriptive statistics (continued). In this topic students will be introduced to the indicators of variation (amplitude, variance, standard deviation, etc.), (Pyrczak, 2004; chap. 3, pp. 114-134)
6	Topic: Analysis of bivariate data. In this topic students will be introduced to bivariate data and then will be introduced to the values, properties and applications of Pearson correlation (Pyrczak, 2004; chapter 4, pp. 134-149).
7	Topic: Probability. In this topic students will be introduced to the basic concepts of probability and the different types of probability
8	Semi-Final Exam
9	Topic: Analysis of variance. In this topic students will be introduced to analysis of variance, analysis of variance procedures, completely random models, random block models. (Pyrczak, 2004; chap. 15, pp. 421-426)
10	Topic: Analysis of variance (continued). In this topic students will be introduced to analysis of variance, experiments with several factors, methods of multiple comparisons. (Pyrczak, 2004; chap. 15, pp. 426-467)
11	Topic: Regression and simple linear correlation. In this topic students will be introduced to regression and simple linear correlation, the least squares method, the coefficient of determination, the regression model and assumptions about it, the control of the significance of the connection. (Pyrczak, 2004; chap. 14, pp. 378-388)
12	Topic: Regression and simple linear correlation (continued). In this topic students will be introduced to, statistical infertility, criteria F and t, evaluation and forecasting, residual analysis, control of assumptions for the linear model, residual analysis, impact observations major, correlative analysis (Pyrczak, 2004; chap. 14, pp. 388-400)
13	Topic: Regression with many variables. In this topic students will be introduced to the multiple regression model and its assumptions, finding the estimate for the multiple regression equation, checking for the importance of the connection, estimating and predicting (Pyrczak, 2004; chap. 14, p. 400- 421)
14	Topic: Testing of Mean. In this topic students will be introduced to single-mean testing, testing the differences between two means with independent groups, comparing mean pairs (Pyrczak, 2004; chap. 14, pp. 324-360)
15	Topic: Testing of Averages (continued). In this topic students will be introduced to tests the means of pairs between independent pairs, (Pyrczak, 2004; chap. 14, pp. 341-360)
16	Final Exam

Prerequisites	The student must attend the course at a minimum rate of 75%.
Literature	• “Statistika” Fakulteti i Ekonomise, UT, grup autorësh , 2012 • Pyrczak, F. (2004). Success at statistics. Glendale, CA: Pyrczak Publishing • Ushtrime të statistikës (Grup autorësh) Fakulteti i Ekonomisë, Universiteti i Tiranës (2005)
References	• W. Navidi (2006), Statistics for Engineers and Scientists, New York Statistika (Cikël leksionesh) Fakulteti i Ekonomisë, Universiteti i Tiranës (2005) • Discovering Statistics Using IBM SPSS STATISTICS 4-th E (Andy Field) 2013

Course Outcome

1	Studentët duhet të fitojnë aftësitë për të hetuar situatat dhe grumbulluar të dhënat statistikore
2	Studentët duhet të fitojnë aftësitë për të përpunuar dhe analizuar të dhënat statistikore duke përdorur metodat e sakta të përpunimit të tyre
3	Studentët duhet të fitojnë aftësitë për të paraqitur dhe interpretuar të dhënat statistikore
4	Studentët duhet të llogarisin treguesit dhe parametrat statistikorë dhe të dijnë t’i interpretojë ato në funksion të zgjidhjes të situatave të ndryshme.

Course Evaluation

In-term Studies	Quantity	Percentage
Midterms	1	30
Quizzes	0	0
Projects	1	20
Term Projects	0	0
Laboratory	0	0
Class Participation	1	10
Total in-term evaluation percent		**60**
Final exam percent		**40**
Total		**100**

ECTS Workload (Based on Student Workload)

Activities	Quantity	Duration (hours)	Total (hours)
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	3	42
Duties	1	15	15
Midterms	1	2	2
Final Exam	1	2	2
Other	0	0	0
Total Work Load			**125**
Total Work Load / 25 (hours)			**5.00**
ECTS			**5.00**