УКРАЇНСЬКО-АМЕРИКАНСЬКИЙ
УНІВЕРСИТЕТ КОНКОРДІЯ

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Business Statistics
Syllabus
ПП 2.8
STAT-221
Specialty: 073 "Management"
Educational program "Management"

Quarter/Year: Fall /2023
Instructor: Yuliya Gladka, PhD
Contact information:
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 Prerequisites: Mathematics for Economics

ECTS Credits: 6
US Credits: 3

Course Description

Business Statistics is a way of thinking that can help make better decisions that are based on data that have been collected. In the current data-driven environment of business it is important to have skills that allow to manipulate data, interpret analytical results, and incorporate results in a variety of decision-making applications. Business statistics focuses on interpreting the results of applying the methods, that allow to work with data effectively. Descriptive statistics is the art of summarizing data. Topics include: histograms, the average, the standard deviation, the normal curve, correlation. Much statistical reasoning depends on the theory of probability. Topics include: expected value, standard error, probability distributions, convergence to the normal curve. Statistical inference is the art of making valid generalizations from samples. Topics include: estimation, tests of statistical significance.

The course discusses the basic concepts of data analysis and statistical computing. Topics covered include basic descriptive measures, probability theory, confidence intervals, and hypothesis testing.

The main objective is to teach students how to think critically about data – how they were collected and analyzed – and their uses in the business activities, such as

– summarize and visualize business data,
– reach conclusions from those data,
– make reliable forecasts about business activities,
– improve business processes,

and to prepare students for future courses having quantitative components.

Course Outcomes

Upon successful completion of this course, students will be able to:
PH3. Demonstrate knowledge of theories, methods and functions of management, modern concepts of leadership.

PH4. Demonstrate skills to identify problems and justify management decisions.
PH5. Describe the content of the functional areas of the organization.
 PH6. Identify skills of search , collection and analysis of information , calculation of indicators to justify management decisions.
PH8. Apply management methods to ensure the effectiveness of the organization.
PH11. Demonstrate skills of situation analysis and communication in various areas of the organization.
PH12. Assess the legal, social and economic consequences of the organization.
PH13. Communicate orally and in writing in state and foreign languages.
PH15. Demonstrate the ability to act socially responsibly and socially consciously on the basis of ethical considerations (motives), respect for diversity and interculturalism.
PH17. Perform research individually and/or in a group under the guidance of a leader.

Competencies
3K3. Ability to abstract thinking, analysis, synthesis.
3K4. Ability to apply knowledge in practical situations.
3K8. Skills in the use of information and communication technologies.
CK6. The ability to act socially responsibly and consciously.
CK10. Ability to evaluate the work performed, ensure their quality and motivate the staff of the organization.
CK11. Ability to create and organize effective communications in the management process.

Internationality:
The international aspect of the course includes adherence to the international standards in educational process, using American textbooks and support materials, considering examples of actual economic problems such as: Case Study 1/ The Consumer Price Index; Case Study 2/ Monitoring the Unemployment Rate; Case Study 3/ Monitoring other important economic indicators using modern international Data Science Resources for developing best practices in statistics.

Communications
For individual issues, students should contact the professor ONLY by given e-mail or by Moodle. In the Subject line they should put: **UACUFirstNameLastName**. E-mail messages will normally be answered within _24__ hours.
Note! Only emails sent from the student's corporate email address will be answered.
Attention! Official and only language used for assessment activities is English. Official and only languages used for communication within the University are Ukrainian and English.

Student Responsibilities
Time Commitment
The study of technical courses is cumulative (i.e., an understanding of earlier material is necessary to grasp concepts covered later). Past experience has shown a high correlation between procrastination and low grades. Students must be committed to completing tasks on time.

Technical Aspects

The student is obliged to provide himself/herself with all the necessary technical equipment for the educational process (laptop or computer, webcam, headsets or headphones and microphone), as well as access to the Internet.
Only students signed-in with their own first and last name are allowed into video lectures in Zoom.

Grading Policy
The course is based on mastery of course outcomes. The student's grade for this course will be calculated based on performance.
Note: the minimal grade to pass a subject is **60%**.
Graduate Grading Guidelines
The assignment of a letter grade for a course is an indication of the student's overall success in achieving the learning outcomes for the course. The course letter grade may be viewed as a summary statement of the student's achievement in individual assessments (assignments & activities). These assessments are intended to identify for students their strengths as well as those areas in need of improvement. Student work is assessed according to the guidelines below.

Course-level Grading guidelines:

Grade	ECTS Grade	International Grade
90% - 100%	A	5 (Excellent)
83% - 89%	B	4 (Very Good)
75% - 82%	C	4 (Good)
70% - 74%	D	3 (Good)
60% - 69%	E	3 (Acceptable)
35% - 59%	FX	Not acceptable, possible repetition of course

Criteria for grading:

ECTS grade	Requirements for the student
A	The student demonstrated a comprehensive systemic and in-depth knowledge of program material; processed basic and additional literature; obtained a solid grasp of the conceptual apparatus, methods, techniques and tools provided by the program; found creative abilities in the presentation of the educational program material both on this issue and on related modules of the course and related courses, or the student had a current control of 90-100 points
B	The student demonstrated good knowledge of program material; processed the basic literature, mastered the conceptual apparatus, methods, techniques and tools provided by the program, but with some inaccuracies
C	
D	The student showed mediocre knowledge of the core program material; learned information mainly from a lecture course or just one textbook; mastered only certain methods, techniques and tools provided by the program
E	

FX	The student has significant gaps in knowledge of the main program material; fragmentary mastered the basic concepts, techniques and tools; significant mistakes are made when using them	

Maximum total possible points - **500** points incl. (midterm and final exam are **60%** of overall evaluation, where Midterm – **20%** and Final – **40%**)
Test / Class Assignment – **25** points (2 times during the course)
Homework Assignment **– 15** points (3 times during the course)
Quiz – **15** points (4 times during the course)
Problem Solving Activity in Class (total possible **45** points)
Midterm exam **- 100** points
Final exam **- 200** points

Student Workload
It is assumed that for each out of 17 class sessions a student spends about 10.5 academic hours of work. This includes 3.5 academic hours of lectures with the instructor and 7 academic hours of personal work. Personal work includes reviewing lectures, doing homeworks, preparing for tests, quizzes using recommended materials.
Please pay attention that 1 academic hour equals to 40 minutes.
 Assignment Format
• All work should be shown in time. If the student misses the deadline – the task is failed.
• There are 4 quizzes (**15 points each**) that a student will take during the lessons,
total **12%**.
• Two Tests/Class Assignments should be done with books closed to help student practice, learn and better understand statistical skills, total **10%**.
• Three Homework Assignments **(15 points each)**, total 9**%**.
These assignments will consist of: (1) a set of exercises at the end of each chapter, and (2) analysis of real datasets downloaded by the students and approved by the instructor. For the data analysis section, students will be required to submit an Excel file.
• Problem Solving Activity in Class (**5** points each class), total 9**%**.
• Midterm covers topics from previous lectures (weeks 1-7). It includes multiple choice questions and cases and takes about **1.5** hour.
• The final exam covers all course material and includes multiple choice questions. It lasts for **2** hours. Admission to the final exam is possible only if all the tasks of the curriculum are covered.
• After the Midterm and Final is graded a student has access to the grade only. Access to the attempt, corrects answers and information whether the answer is correct cannot be granted.

Academic dishonesty
Academic integrity is submitting one's own work and properly acknowledging the contributions of others. Forms of academic dishonesty include:
1.   Plagiarism – submitting all or part of another's work as one's own in an academic exercise such as an examination, a computer program, or written assignment.
2.   Cheating – using or attempting to use unauthorized materials on an examination or assignment, such as using unauthorized texts or notes or improperly obtaining (or attempting to obtain) copies of an examination or answers to an examination. Including the use of

artificial intelligence and pre-prepared answers to the questions of tasks is prohibited (unless otherwise specified in the task itself or allowed by the instructor).

3.   Facilitating Academic Dishonesty – helping another commit an act of dishonesty, such as substituting for an examination or completing an assignment for someone else.

4.   Fabrication – altering or transmitting, without authorization, academic information or records.

Any violation of these rules constitutes academic dishonesty and is liable to result in a failing grade and disciplinary action. In case of any academic dishonesty a student is not allowed to continue or retake the assessment activity and for the Final the unsatisfactory grade ("0") is assigned for the course total. Cases of the academic dishonesty are not considered by the Academic Council.

Midterm and Final are valid only if they are taken on-campus (room defined by the dean's office) and on UACU's computer/laptop or online on the student's computer/laptop using Zoom and other conditions defined by the dean's office to avoid the cases of academic dishonesty. Students who will not meet this requirement will be expelled from the course with grade "0".

In case of missed Midterm or Final exam (for a valid reason like sickness or an emergency) a request to repeat the exam is possible. Permit to repeat a midterm or final exam is done through a letter to the dean's office with request and approval of subject lecturer.

Submission or retaking of any assessment activities after deadlines are forbidden.

Submission & Return Policy

Assignments must be submitted to the professor on or before the due date indicated in the Course Schedule. The assignments submitted after the due dates receive zero points.

**** **NO MAKE –UP QUIZZES AND EXAMS** ****

Schedule

Lecture #	Research Projects	Assignments Due	Points (for each assessment activity)
Topic 1.	**Topic 1. Introduction to Business Statistics** Business Statistics: What is it? Descriptive and Inferential Statistics. The elements of Business Statistics. Types of Data: Nominal, Ordinal, Interval/Ratio.	Review Lecture Quiz	**_15_**
Topic 2.	**Topic 2. Descriptive Statistics: Graphical Methods for Describing Data** Frequency Distribution and Relative Frequency Distributions. Graphical Methods for displaying of Numerical Data: Histograms and Stem-and-Leaf Displays.	Review Lecture Class Problem Solving Activity	**_5_**
Topic 3.	**Topic 3. Descriptive Statistics: Numerical Methods for**	Review Lecture	

	Describing Data Population Mean, Sample Mean, Properties of the Arithmetic Mean, Median, Mode	Quiz	_15_
Topic 4.	**Topic 4. Numerical Methods for Measuring Variability** Measures of Dispersion, Variance and Standard Deviation, Quartiles, Deciles, Percentiles, Computer Commands: Excel.	Review Lecture Test / Class Assignment	_25_
Topic 5.	**Topic 5. Probability: Basic Concepts and Theorems of Probability Theory** Events, Sample Space and Probability, Additive Rule and Mutually Exclusive Events, Complementary Events.	Review Lecture Class Problem Solving Activity Homework Assignment	_5_ _15_
Topic 6.	**Topic 6. Probability: Conditional Probability and Bayes' Theorem** Dependent and Independent Events, Conditional Probability, Multiplication Rule, Bayes' Theorem.	Review Lecture Class Problem Solving Activity	_5_
Topic 7.	**Topic 7. Random Variables and Discrete Probability Distributions** Two types of Random Variables, Mean, Variance and Standard Deviation of a Probability Distribution, Binomial Probability Distribution, Hypergeometric Probability Distribution, Poisson Probability Distribution	Review Lecture Homework Assignment Class Problem Solving Activity	_15_ _5_
	Midterm (20% out of total amount of points for the course)		_100_
Topic 8.	**Topic 8. The Normal Probability Distribution** Family of Normal Probability Distributions with different Means and Standard Deviations, Standard Normal Probability Distribution, Computing Probabilities for z-Scores	Review Lecture Quiz	_15_
Topic 9.	**Topic 9. Sampling Methods** Sampling the Population, Distribution of Sample Mean	Review Lecture Class Problem Solving Activity	_5_
Topic 10.	**Topic 10. Central Limit Theorem** Standard Error of the Mean, Computing Probabilities for z-Scores	Review Lecture Quiz	_15_

Topic 11.	Topic Topic 11. Confidence Intervals a brie Point Estimates of Parameters, Confidence Intervals	Review Lecture Class Problem Solving Activity	_5_
Topic 12.	Topic Topic 12. One-Sample Tests of Hypothesis Null and Alternative Hypotheses, One-Tailed and Two-Tailed Tests of Significance, Type I and Type II Errors Hypothesis Testing	Review Lecture Test / Class Assignment	_25_
Topic 13.	Topic 13. Two-Sample Tests of Hypothesis Hypothesis Testing: Population Means, Tests about Proportions, Dependent Samples	Review Lecture Class Problem Solving Activity Homework Assignment	_5_ _15_
Topic 14.	Topic 14. Correlation Analysis Coefficient of Correlation, Coefficient of Determination, Testing the Significance of the Correlation Coefficient	Review Lecture Class Problem Solving Activity	_5_
Topic 15.	Topic 15. Regression Analysis Least Squared Method, Line of Regression, Standard Error of Estimate	Review Lecture Class Problem Solving Activity	_5_
	Final (40% out of total amount of points for the course)		_200_

Recommended Materials
 1) James T. McClave, P George Benson "Statistics for Business and Economics", 14th edition, 2022.
2) D. Lind, W. Marchal, S. Wathen "Statistical Techniques in Business and Economics", Eighteenth Edition, 2021.
3) Robert A. Stine, Dean Foster Statistics for Business: Decision Making and Analysis, 3rd edition, 2021.
4) David M. Levine, David F. Stephan, Kathryn A. Szabat "Business Statistics: A First Course", 8th Edition, 2020.
5) P. Newbold, W. L. Carlson, B. M. Thorn "Statistics for Business and Economics", Global Edition, 2013.

Internet links
1) https://www.khanacademy.org/math/ap-statistics (for   straightforward explanations of statistical terms and concepts)
2) https://stattrek.com/tutorials/ap-statistics-tutorial.aspx
3) https://www.statista.com/ (statistics portal for market data, market research and market

studies)

The above schedule and procedures are subject to change in the event of extenuating
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Протокол засідання кафедр № 4 від 22.08.2023 року

Проректор з навчально-методичної
роботи

Л.І.Кондратенко

Завідувач кафедри

Л.В.Жарова

Викладач

Ю.А.Гладка