УКРАЇНСЬКО-АМЕРИКАНСЬКИЙ
УНІВЕРСИТЕТ КОНКОРДІЯ

UKRAINIAN-AMERICAN
CONCORDIA UNIVERSITY

Україна, 01030, м. Київ, вул. Пирогова, 9
+380(44)236-19-16; 486-06-66; +380(50)331-42-95

www.concordia.edu.ua
info@uacu.edu.ua

9, Pirogov street, Kyiv, 01030, Ukraine
+380(44) 236-19-16, 486-06-66; +380(50)331-42-95

Statistical Business Analysis
Master Degree
ІПП 2.4
MBA 533
Syllabus
Specialty: 073 "Management"
Educational program "Business Administration"

Instructors: **Yuliya Gladka, PhD**	**ECTS Credits: 6**
Contact information: Email: **yuliya.gladka@uacu.edu.ua**	**US Credits: 3**

Course Description

Statistical Business Analysis uses basic statistical methods and introduces the students to methods of quantitative analysis useful in their professional business and management activities. It is important to be able to organize and use data intelligently and correctly. The main focus of this course is to provide an understanding of basic statistical (inference) tools that are useful and necessary for economists in managerial decision making.

Statistical inference will allow one to make generalizations based on sample data, and answer questions such as *estimating* product reliability, *testing* investment strategies, *statistical quality control* and *predicting* a product's sales on the basis of its characteristics. The course topics include hypothesis testing, correlation and regression analysis, time-series analysis and forecasting, decision making with sample information, business analytics. Practical sessions using Excel represent an integral part of the course ensuring that the students acquire skills and gain experience of data analysis in solving business and management problems.

After the course, the students should be able to apply the most typical quantitative methods to analyze data, critically assess the validity of statistical data and made conclusions before making business decisions, perform basic statistical and econometric analysis as well as interpret and discuss its results.

Learning Outcomes

PH.2. Identify problems in the organization and justify methods of solving them.

PH.4. Substantiate and manage projects, generate business ideas.

PH.8. Apply specialized software and information systems to solve problems of organization management.

PH.12. Be able to delegate authority and management of the organization (unit).

PH.13. Be able to plan and implement information, methodological, material, financial and personnel support of the organization (unit).

Competences

3К3. Skills in the use of information and communication technologies;
СК4. Ability to effectively search and organize resources.

Internationality:

- Studying in English
- International Educational Standards
- International Teachers
- International Data Sources
- Multicultural groups
- International Textbooks and Software

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.

Student Responsibilities

Time Commitment

The study of the course 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.

Note! 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 70% (for Master's degree)

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)
35% - 69%	**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 **– 10** points (3 times during the course)
Quiz – **15** points (2 times during the course)
Problem Solving Activity in Class **5** points (total possible 15 points)
Individual Learning Projects **– 15** points (5 times during the course)
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 homework assignments, tests and working on the course materials.

Note! 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.

• Midterm covered topics from previous lectures (weeks 1-6). It included multiple choice questions and cases (essays) and took about 90 minutes.

• The Final exam covered all course material and included multiple choice questions and cases (essays). It lasts for 90 minutes. 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.
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.

Schedule

	Lecture #	Research Projects	Assignments Due	Points (for each assessment activity)
	Lecture 1	**Topic 1.** ***Introduction to Business Statistical Analysis*** Overview of business statistics: collection of data, presenting data in business. Types of data. Cross-sectional data, time-series data and panel data. Sampling concepts. Sampling a process. Analyzing sampling methods. Statistical process control. Runs plot. Survey data analysis: basic steps of survey research.	Review Lecture Exercises Score for activity in class	**5**
	Lecture 2	**Topic 2.** ***Data Visualization - Visual Analytics*** Presenting management and business information: visual description methods. The impact of the type of scale on business statistical analysis. Creating charts in Microsoft Excel. Misleading graphs and Charts. Excel template design. Pivot Tables. Visualizing statistical graphical methods using Excel**.**	Review Lecture Homework Assignment	**10**
	Lecture 3	**Topic 3.** ***Descriptive Statistics and Exploratory Data Analysis*** Measures of central tendency: mean, median, mode and relationships among them; measures of dispersion: range, standard deviation, coefficient of variation. The empirical rule. Visualizing basic concepts of descriptive statistics, statistical data analysis through different business and management research cases. Using Descriptive Statistics to analyze grouped data.	Review Lecture Individual Learning Project	**15**
	Lecture 4	**Topic 4.** ***Statistical Analysis of Economic Activities based on Discrete Distributions*** Discrete probability distributions: the Binomial Probability Distribution and the Poisson Distribution. Identifying the parameters of common discrete distributions and how they affect a distribution. Descriptive statistics for common discrete distributions. Conjoint analysis and choice models. Visualizing discrete distributions.	Review Lecture Exercises Score for activity in class	**5**

		Statistical analysis of economic activities based on discrete distributions using Excel.		
	Lecture 5	**Topic 5.** ***Market Research using Statistical Analysis*** The Normal Probability Distribution. Normal approximation to the Binomial distribution and to the Poisson distribution. Sampling distribution of the sample mean. Effect of Sample Size on Sampling Distribution. The Central Limit Theorem. A Comparison of Confidence Intervals and Tolerance Intervals. Market Research Examples using Statistical Analysis.	Review Lecture Quiz	**15**
	Lecture 6	**Topic 6.** ***Applied Statistical Decision Making*** Estimation theory and hypothesis testing: formulation of hypotheses, types of decisions. Application of z-test, t-test. The p-value. The Chi-square distribution. Statistical thinking in business decisions. Applied statistical decision making.	Review Lecture Individual Learning Project	**15**
	Lecture 7	**Topic 7.** ***Statistical Inference*** Overview of ANOVA (Analysis of variance). Basic concepts of experimental design. The randomized block design. One-factor ANOVA (completely randomized design). Multiple comparisons. Two-way analysis of variance. Statistical Inference in ANOVA using computer package: business statistical analysis.	Review Lecture Test / Class Assignment	**25**
	Class 8	**Midterm Exam (20%)**		**100**
	Lecture 9	**Topic 8.** ***Linear Regression Analysis*** Overview of linear models. The Simple Linear Regression model. The least squares estimates, and point estimation and prediction. Linear Regression analysis: the coefficient of determination and correlation; model assumptions and standard error; testing significance of slope and y-intercept; an F test for the model. Visualizing Linear Regression Models.	Review Lecture Individual Learning Project	**15**
	Lecture 10	**Topic 9.** ***Multiple Regression and Model Building*** The Multiple Regression model. Multiple Linear Regression. Multiple Regression analysis: R^2, adjusted R^2, and the overall F test. Systematic Multiple Regression Model Building Approach. Multicollinearity. Interaction: incorporating interaction terms in a Regression Model. Regression with categorical variables. Multiple regression analysis in	Review Lecture Exercises Score for activity in class	**5**

		different business cases: analyzing factors affect return on assets in a bank, generate the biggest impact to a product's quality, the profit associated with a further boost in each of the impact factors.		
	Lecture 11	**Topic 10.** ***Time Series Forecasting*** Business forecasting: the importance of forecasting, forecasting techniques. Time Series Analysis: time series data, a time-series plot, components of time series, trend analysis. Forecasting models for stationary time series: Moving average model, Exponential smoothing model. Time Series Regression. Autocorrelation in Time Series: Autoregressive models. Advantages and limitations of business forecasting. Applications in business decision-making.	Review Lecture Homework Assignment	**10**
	Lecture 12	**Topic 11.** ***Index Numbers*** Index Numbers: introduction, definition of an Index Number, classification of Index numbers, Base year and current year. Main steps in the construction of Index Numbers. Methods of computation of Index Numbers: Simple Price Index, Aggregate Price Indexes: weighted and unweighted price indexes. A Laspeyres index, a Paasche index. Economic indicators and indexes: Gross domestic product (GDP), Consumer price index (CPI).	Review Lecture Quiz	**15**
	Lecture 13	**Topic 12.** ***Statistical Quality Control*** Statistical Process control: causes of variation, Quality Control charts, purpose and logic of constructing a Control chart, types of Control charts, P-chart, computing the control limits for the Range and the Mean. Red Bead Experiment. Process capability. Capability indexes. Six Sigma Management model. Analyzing statistical applications in Quality management. Control Charts using Excel.	Review Lecture Individual Learning Project	**15**
	Lecture 14	**Topic 13.** ***Introduction to Business Analytics*** Descriptive Analytics. Predictive Analytics. Prescriptive Analytics. A Visual Perspective of Business Analytics. Models in Business Analytics. Supervised and Unsupervised methods. Creating descriptive analytics dashboard elements. Understanding fundamental business analytics concepts. Analyzing uncertainty and model assumptions. Solving applications with analytics.	Review Lecture Homework Assignment	**10**
	Lecture 15	**Topic 14.** ***Introduction to Data Mining*** The scope of Data Mining. Big Data. Data Discovery Methods. Classification	Review Lecture	

		Methods, Discriminant Analysis. Neural Networks. Cluster Analysis. Dendogram. Multidimensional Scaling. Association Rule Mining. Cause-and-Effect Modeling. Using Correlation for Cause-and-Effect Modeling.	Individual Learning Project	**15**	
	Lecture 16	**Topic 15.** ***Decision Making*** Role of Decision Analysis, formulating Decision problems, the Payoff Table and Decision Trees. Decision Strategies under Uncertainty: Aggressive Strategy, Conservative Strategy and Opportunity-Loss Strategy. Criteria for Decision Making (computing expected values, standard deviations, coefficients of variation and return-to-risk ratio). Expected profit under certainty and the value of perfect information. Decision making with sample information. The concept of utility.	Review Lecture Test / Class Assignment	**25**	
Class 17		**Final Exam (40%) (200 points)**	Final Exam Final Individual Learning Project	**100** **100**	

Recommended Materials

Main Materials:

1. Business statistics in practice: using data, modeling, and analytics, 8th Edition by Bruce L. Bowerman, Richard T. O'Connell, Emily S. Murphree, 2017 ISBN 978-1-259-54946-5
2. Quantitative Approaches in Business Studies, 8th Edition by Clare Morris, 2012 ISBN 978-0-273-73863-3
3. Statistics: Informed Decisions using Data, 5th Edition by Michael Sullivan, 2018 ISBN 978-1-292-15711-5
4. Stats: Data and Models by Richard D. Veaux, Paul Velleman, David Bock 5th Edition, 2020 ISBN 978-0-321-75932-0
5. Statistics for Economics, Accounting and Business Studies, fourth edition by Michael Barrow, 2006 ISBN: 978-0-273-68308-7
6. Microsoft Excel Data Analysis and Business Modeling (5th Edition) 5th Edition by Wayne Winston, 2011 ISBN-13: 978-1509304219

Additional Reading Materials

AGOA info site https://agoa.info/
Asian Development Bank Statistics https://www.adb.org/data/statistics
Asset Macro https://www.assetmacro.com/market-data/
BIS site http://www.bis.org/statistics/index.htm
Global knowledge database site https://globaledge.msu.edu/tools-and-data/dibs
EuroStat http://ec.europa.eu/eurostat
FAQStat http://www.fao.org/faostat/en/#home
IDEA site http://www.idea.int/data-tools
International Labour Organization http://www.ilo.org/global/lang--en/index.htm
International Monetary Fund http://www.imf.org/external/ns/cs.aspx?id=28

Statistical world factbook https://www.cia.gov/library/publications/the-world-factbook/index.html

The Statistics portal https://www.statista.com/

United Nation http://data.un.org/

World Bank http://www.enterprisesurveys.org/

The above schedule and procedures are subject to change in the event of extenuating circumstances.

Протокол засідання кафедр № 2 від 23.08.2021 року

Проректор з навчально-методичної роботи Л.І.Кондратенко

Завідувач кафедри А.В.Кінаш

Викладач Ю.А.Гладка