December 5, 2022

LINCOLN UNIVERSITY

Spring 2023

Mondays and Wednesdays 3:30 pm – 5:15 pm

COURSE:	**BA 115 – STATISTICS** - 3 units (30 h of lectures and 30 h of sections) Course Level – Developed (D)
INSTRUCTOR (P):	Dr. Mikhail Brodsky, president@lincolnuca.edu, 510-208-2803
ASSISTANT (A):	Ms. Olesya Agafontseva, oagafontseva@lincolnuca.edu
OFFICE HOURS:	Day of teaching, 3:00 pm – 3:30 pm (instructor in room 203) Day of teaching, 5:15 pm – 5:45 pm (assistant in room 308)
TEXT:	1. "Statistics" by David Freedman, Robert Pisani, and Roger Purves (**FPP**). Fourth edition, W.W. Norton & Company. ISBN 13-978-0-393-92972-0
TOOLS:	Students will need to use a simple calculator during lectures. A laptop with Excel software is recommended for sections.

CATALOG DESCRIPTION:
This course is designed for both the business major and for the non-business student without previous knowledge of statistics. Emphasis is on descriptive statistics and inferential statistics with relevant applications to solving problems, hypothesis testing and decision-making. Important statistical models and distributions will be discussed (3 units). Prerequisite: Math 10 or Math 15.

LEARNING OBJECTIVES:
The purpose of this course is to introduce students to the logic, application, and interpretation of the most common statistical techniques used in business and social sciences. This class is designed for those who want to know how to extract meaningful information from numbers, or how to make interpretation of data from newspapers, or how to select a strategy of gambling on a roulette table, playing on stock market, or just choosing a secretary. Decision-making process will be easier after it. The class does not require knowledge of any complicated mathematical subject, but requires common sense and practical logic. The students will learn the basic concepts and techniques of business statistics and probability, and learn how to apply them. The students will also create mathematical models and build a solid foundation in the principles of statistical thinking using case study and example driven discussions of all basic business statistics topics.

INSTRUCTIONAL METHODS:
Lecture method is used in combination with the practical use of a calculator, special charts, and Excel software to answer application questions in statistics. The emphasis will be on learning by solving problems. Every student is welcome to participate in intensive classroom activities. Reading and problem-solving assignments will be made throughout the course.

There will be two different sessions of the class. The first session is presentation of material (lectures) by the instructor/professor (**P**). Students will learn principles and concepts covered in the text as well as in various sources on relevant topics. The teaching assistant (**A**) will conduct the second sessions (sections). She will help students to review the material as well as work on cases relevant to the topics. There may be class discussions and group presentations by students on the project assignments during the sections. Home works will be given and solved during sections.

Assignments and projects require students to actively use resources of the library. Detailed guide to business *resources of the library* as well as the description of Lincoln University approach to *information literacy* are available at the Center for Teaching and Learning website (ctl.lincolnuca.edu).

COURSE LEARNING OUTCOMES[1]:

	Course Outcome	Program LO	Institutional LO	Assessment Activities
1	Students will develop logic, application, and interpretation of the most common univariate statistical techniques used in business and social sciences.	PLO 1	ILO 1a, ILO 2a	Homework, Midterm
2	Students will learn the concepts and techniques of statistics and probability. The emphasis of the course is on the application of the statistical techniques.		ILO 1a, ILO 6a	Homework, Midterm, In-class discussion
3	Students will be able to construct mathematical models and display a solid foundation in the principles of statistical thinking using case study and example-driven discussions of all basic business statistics topics.	PLO 2	ILO 1a, ILO 6a, ILO 7a	Midterm, Final exam
4	Students will be able to choose an appropriate statistical analysis for data they plan to analyze, select an appropriate model, interpret the analysis, and write up the results.	PLO 4	ILO 1a, ILO 6a, ILO 7a	Midterm, Final exam

REQUIREMENTS:

All students are required to attend the class. Continuous assessment is emphasized. Students must complete all assignments and take mid-term exam and final exam ON THE DATES DUE. The tests are open book but plagiarism from other students will result in the grade "F".

No computers or cellular phones will be allowed to use during lectures or tests.

GRADING:

Home works	assignments at sections	10%
Classroom attendance	lectures and sections	10%
Quizzes	2 quizzes (2/22; 4/5) at sections	10%
Mid-term exam	March 13	30%
Final exam	May 8	40%

Grades will be calculated "on the curve" to be at least C (63%) average for the class. **For the total**:

(A) - 91% and above, (**A-)** - 86-90%,
(B+) - 81-85%, (**B)** - 76-80%, (**B-)** - 71-75%,
(C+) - 66-70%, **(C)** - 61-65%, (**C-)** - 56-60%,
(D+) - 51-55%, **(D)** - 46-50%,
(F) - 45% and below.

[1] Detailed description of learning outcomes and information about the assessment procedure are available at the Center for Teaching and Learning website (ctl.lincolnuca.edu).

SPRING 2023 SCHEDULE OF TOPICS

Week	Date	Topics	Chapters FPP
1	1/23 A	**Syllabus. Review of math tools**: numbers (fractions and decimals); graphs (scales, coordinates, transformations, distance between points, linear function); algebra (sigma symbol, square formulas).	Ch. 7
	1/25 P	**Introduction to Statistics: Variables, Scales, Experiments**	Ch.1, 2
2	**1/30 P**	**Descriptive Statistics:** Histogram	Ch. 3
	2/1 A	**Continue review of math and software tools.** Excel. Canvas	
3	**2/6 P**	**Continue Descriptive Statistics:** Average and Standard Deviation	Ch.4
	2/8 A	**Review of Problems:** Descriptive Statistics**.** The average, drawing histogram, the average and the histogram, the standard deviation	
4	**2/13 P**	**Normal Distribution:** The normal curve. The normal approximation for data, percentiles, change of scale	Ch. 5, 6
	2/15 P	**Correlation**: The scatter diagram, the correlation coefficient	Ch. 8, 9
5	2/20	**No class – Presidents' Day**	
	2/22 A	**Quiz 1 and Solutions** (Descriptive Statistics) **Practice. Normal Distribution:** Finding area under the normal curve, the normal approximation for data, percentiles, change of scale	
6	**2/27 P**	**Correlation and Regression:** The concept of regression, the graph of average, the regression method for individuals	Ch. 10, 11, 12
	3/1 A	**Practice:** Calculating the correlation coefficient (r), matching the scatter diagrams with the correlation coefficient, ecological correlations, association is not causation.	
7	3/6 A	**Practice Midterm.** Descriptive Statistics, Normal Distribution, Correlation and Regression. Questions and discussions	Ch. 1-12
	3/8 P	**Solutions for Practice Midterm. Review and Discussions**	
8	**3/13 P**	**Midterm Exam.**	
	3/15	**No class – Spring recess**	
9	**3/20 P**	**Probability and Random Variables** Probability histograms	Ch. 13, 14, 15
	3/22 A	**Probability and Random Variables Practice:** Conditional probability; Independence; Chance processes; Normal approximation for probability	
10	**3/27 P**	**The Law of Averages. Box Model and Sampling.**	Ch.16, 17, 18
	3/29 P	**Sampling and Confidence Intervals:** expected value and standard error.	Ch. 19, 20, 21
11	4/3 A	**Practice: Law of average and the normal approximation** **Review exercises**: Making a box Model	
	4/5 A	**Quiz 2 and Solutions** (Box Model, Probability) **Practice:** Sampling**;** Confidence Intervals	
12	**4/10 P**	**Interference for Percentage**. Accuracy of percentage and averages	Ch. 21, 23
	4/12 A	**Practice**: **Interference for Percentage:** sample average**;** standard error	
13	**4/17 P**	**Test of Significance:** The null and the alternative hypothesizes, test statistic and significance level, testing averages.	Ch. 26, 27
	4/19 A	**Practice**: **Test of Significance:** Statistic and significance level; making a test of significance**;** zero-one boxes.	
14	**4/24 P**	**Chi-Square Test:** testing independence	Ch. 28
	4/26 A	**Practice: Chi-Square Test. Review of the course**	
15	5/1 A	**Practice Final:** questions, discussions	Ch. 13, 14, 16, 17, 18, 20-23, 26, 27
	5/3 P	**Solutions of Practice Final, Review and and Discussions**	

16	**5/8 P**	**Final Exam**	Ch. 13, 14, 16, 17, 18, 20-23, 26, 27
	5/10 A	**Solutions of Final Exam and Grades**	

This schedule may be changed during the semester if necessary to match student's learning success.