**ECONOMICS 215-001**
**Statistics**
**Spring 2023**
**12:30PM – 1:45PM, M/W**
**HLH 018**


**Instructor**: Dr. Yuxi Yao
**Office**: HLH 525B
**Email**: yyao10@unl.edu
**Office Hours**: M/W: 3:30PM-5:00PM or by appointment


**Prerequisites:** Sophomore standing; MATH 104 or equivalent or MATH 106/108H; BSAD 50; 2.5 GPA

## Course Description

The course is an introduction to basic probability and statistical methods that are used in conjunction with economic and business information. Topics include descriptive statistics, probability foundations, probability distributions, sampling distributions, methods of statistical inference, and bivariate relationships. This course lays the foundation for subsequent courses.

## Class Materials

1. Essentials of Statistics for Business and Economics; Anderson, et al., 9th edition, 2020 (textbook).
2. PowerPoint Slides: As the semester progresses, you will be able to view/download the slides and other materials used in the lecture in Canvas.
3. Assignments: Assignments and grades will be posted in Canvas. Submissions of assignments should be done through Canvas as well.
4. Microsoft Excel: We will use Microsoft Excel for group assignments. UNL students have subscriptions to Office 365, which includes Microsoft Excel. Check this link for installation instructions.
5. Calculator: You will need a calculator for assignments and exams.

## Textbook Purchase Options

**Option 1.** Through the UNL Bookstore's Inclusive ACCESS program.
Note: The bookstore's Inclusive ACCESS program is provisioning eBook access for every student enrolled in this course; every student receives an email from "donotreply@redshelf.com" to their @huskers.unl.edu email address with information for how they access the digital material, and an email from "noreply@follett.com" explaining ACCESS and referencing the opt out process. For Spring 2023 students have through February 1st to opt out (or to opt back in after initially opting out) if choosing to obtain the required material through another means. If a student opts out of the eBook access, the digital access will be revoked and UNL will remove the eBook fee from the student's account.
**Option 2.** eBook from Cengage: Anderson/Sweeney/... 9th ©2020, Essentials of Statistics for Business & Economics, 9780357045435. Click here to access eTextbook.

## Grading

Total course points for this course will be a combination of the following:

**i) 4 Individual Assignments (5 Points each, 15 Points total)**
Your lowest score will be dropped and only the highest 3 will count towards your grade. *Late submissions will not be accepted.*

**ii) 3 Group Excel Assignments (5 Points each, 10 Points total)**
Your lowest score will be dropped and only the highest 2 will count towards your grade. You need to form your own groups with a maximum group size of 5 students and inform me by February 10th, 2022. Students who do not form groups by February 10th will be randomly assigned to a group. For each group, one student should send me an email with the names and UNL emails of all group members. Please include all your group members in the mailing list. Upon receiving the email, I will reply to all students in the group to confirm. For each assignment, each group needs to make one and only one submission. ***Late submissions will not be accepted.***

All students in the group receive the same grades for the assignments. ***Exception: In the case where a student does not respond to other group members and/or refuses to work on a group assignment (as confirmed by other group members), the student's grade for that group assignment will be zero and this student will be put in a separate group for all remaining group assignments.*** Please keep in mind that, while I will let you decide exactly what and how much work each group member needs to do, the expectation is that all students should contribute to the completion of the group assignments.

**iii) 4 Module Exams (15 Points each, 45 Points total)**
Your lowest score will be dropped and only the highest 3 will count towards your grade. Module Exams will be held in the Digital Learning Center. The (tentative) exam dates are provided below.

**iv) A Final Cumulative Exam (30 points)**

**Bonus Points:** To help you learn the material and prepare for the exams, I will provide one practice quiz for each chapter covered in this class (11 quizzes in total). You are encouraged to work on those quizzes as the semester progresses. To provide some extra incentive, for each practice quiz completed, you will obtain 0.5 extra course point.

**Tentative Module and Final Exam Dates**
**Module Exam 1**: February 17 (Friday) – February 19 (Sunday)
**Module Exam 2**: March 9 (Thursday) – March 11 (Saturday)
**Module Exam 3**: April 14 (Friday) – April 16 (Sunday)
**Module Exam 4**: May 5 (Friday) – May 7 (Sunday)

**Final Cumulative Exam**: May 16 (Tuesday) – May 18 (Thursday)
The final cumulative exam will also be held in the Digital Learning Center. A review session for the final exam will be scheduled during the week before the final exam. Details will be confirmed and communicated later in the semester.

**Make up exams**:
There will be no makeup exams after the exam period in this class. If you need to write the exam

before the exam period for valid reasons, please contact me at least one week before the exam period. If you miss one module exam, it will be considered as the module exam with the lowest score and will be dropped. Should you miss the final exam or miss more than one module exam, I will require proof of the reason and will decide the validity of the excuse on a case-by-case basis. Should I find your excuse valid, 1) if you miss two module exams, the remaining two module exams will be scaled up to count for 45% of your grade; 2) if you miss the final exam and no more than one module exam, the module exams that you take will be scaled up to count for 75% of your grade; 3) if you miss a) three or more module exams or b) the final exam and two or more module exams, you may be given the grade "Incomplete." The final decision rests with me.

**Standard Grading Scale:**

| Your Score | Grade | Your Score | Grade |
|---|---|---|---|
| 90% to 100% | A/A+ | 68% to 75% | C |
| 88% to 90% | A- | 65% to 68% | D+ |
| 85% to 88% | B+ | 61% to 65% | D |
| 81% to 85% | B | 58% to 61% | D- |
| 78% to 81% | B- | Below 58% | F |
| 75% to 78% | C+ | | |

**Achievement-Centered Education (ACE) Designation**

**Institutional Objective and Learning Outcome #3**: Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.

**Course Objectives**: (1) Acquaint students with the roles that probability and statistics play in examining and evaluating economic and business information; (2) Provide students with opportunities to become proficient with selected statistical methods that are commonly encountered in the business world; (3) Expose students to problem-solving environments where inferences and decisions must be made on the basis of statistical evidence, calculations, and probabilistic reasoning.

**Learning Outcome Assessments**: Exams, computer-based assignments and regular assignments.

**NOTES**

1. Students at the University of Nebraska are members of an academic community in which academic integrity and responsible conduct are essential for the community to function. To ensure that students know what is expected of them, the University has adopted the Standards of Academic Integrity and Responsible Conduct ("Standards").
2. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible so we can make the necessary arrangements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office. Please visit the SSD webpage.
3. Stress, depression, anxiety, alcohol abuse, eating disorders, and other mental health challenges affect at least one in five college students. Resources for supporting student mental health can be found here.
4. If in-person classes are canceled and the campus follows instructional continuity plans, the

information will be communicated via Canvas announcements.

5. For other university-wide information and policies, please use this link.

**TENTATIVE COURSE OUTLINE**

**Module 1:**

- **Topic 1**

  Data and Statistics (Chapter 1)
  - Applications in Business and Economics
  - Data
  - Data Sources
  - Descriptive Statistics
  - Statistical Inference
  - Ethical Guidelines for Statistical Practice

- **Topic 2**

  Descriptive Statistics: Tabular and Graphical Displays (Chapter 2)
  - Summarizing Data for a Categorical Variable
  - Summarizing Data for a Quantitative Variable
  - Summarizing Data for Two Variables Using Tables
  - Summarizing Data for Two Variables Using Graphical Displays

- **Topic 3**

  Descriptive Statistics: Numerical Measures (Chapter 3)
  - Measures of Locations
  - Measures of Variability
  - Measures of Distribution Shape
  - Measures of Association Between Two Variables

**Module 2:**

- **Topic 4**

  Introduction to Probability (Chapter 4)
  - Random Experiments, Counting Rules, and Assigning Probabilities
  - Events and Their Probabilities
  - Some Basic Relationship of Probability
  - Conditional Probability

- **Topic 5**

  Discrete Probability Distributions (Chapter 5)
  - Random Variables
  - Developing Discrete Probability Distributions
  - Expected Value and Variance
  - Bivariate Distributions and Covariance
  - Binomial Probability Distributions

- **Topic 6**

  Continuous Probability Distributions (Chapter 6)
  - Uniform Probability Distribution
  - Normal Probability Distribution

**Module 3:**

- **Topic 7**

  Sampling and Sampling Distribution (Chapter 7)
  - Selecting a Sample
  - Point Estimation
  - Introduction to Sampling Distributions
  - Sampling Distribution of the Mean
  - Sampling Distributions of the Proportion
- **Topic 8**

  Interval Estimation (Chapter 8)
  - Population Mean: Known Population Variance
  - Population Mean: Unknown Population Variance
  - Population Proportion
  - Determining the Sample Size
- **Topic 9**

  Hypothesis Tests (Chapter 9)
  - Developing Null and Alternative Hypothesis
  - Type I and Type II Errors
  - Population Mean: Known Population Variance
  - Population Mean: Unknown Population Variance
  - Population Proportion

**Module 4:**

- **Topic 10**

  Inference About Means and Proportions with Two Populations (Chapter 10)
  - Difference Between Two Population Means: Known Population Variances
  - Difference Between Two Population Means: Unknown Population Variances
  - Difference Between Two Population Means: Matched Samples
  - Difference Between Two Population Proportions
- **Topic 11**

  Simple Linear Regression (Chapter 14)
  - Simple Linear Regression Model
  - Least Squares Method
  - Coefficient of Determination
  - Model Assumptions
  - Inferences and Predictions

## TENTATIVE COURSE SCHEDULE

| Module | Areas of Focus | To do list and due dates |
|---|---|---|
| Module 1 | Chapters 1, 2 and 3 | Individual Assignment 1: Due on Feb 14 at 11:59PM<br>Module Exam 1: Feb 17 – Feb 19 |
| Module 2 | Chapters 4, 5, and 6 | Individual Assignment 2: Due on Mar 7 at 11:59PM<br>Group Excel Assignment 1: Due on Mar 8 at 11:59PM<br>Module Exam 2: Mar 9 – Mar 11 |
| Module 3 | Chapters 7, 8, and 9 | Individual Assignment 3: Due on Apr 11 at 11:59PM<br>Group Excel Assignment 2: Due on Apr 19 at 11:59PM<br>Module Exam 3: Apr 14 – Apr 16 |

| | | |
|---|---|---|
| Module 4 | Chapters 10 and 14 | Individual Assignment 4: Due on May 2 at 11:59PM<br>Group Excel Assignment 3: Due on May 10 at 11:59PM<br>Module Exam 4: May 5 – May 7 |

**Disclaimer:**

I reserve the right to modify this syllabus as the semester progresses to meet what I believe to be the needs of the class.