Business and Economic Statistics II
ECO 2200-107
Spring 2024

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Student Office Hours: Monday, Wednesday 11:00 a.m.-12:30 p.m. (in-person or via Zoom); Friday 11:00 a.m.-12:30 p.m. (via Zoom); and by appointment.
Communication Expectations: Please do not hesitate to email me with questions. I should be able to respond within 24 hours.

Course Description: The purpose of this course is to discuss statistical tools used to infer population characteristics from sample data. This includes testing hypotheses concerning population parameters and conducting regression analyses.

General Education: This course is included in the Quantitative Literacy component of the General Education program and meets Goals 1 and 2: *Thinking Critically and Creatively* and *Communicating Effectively*. Please feel free to check the following link for associated Student Learning Outcomes (SLOs): https://universitycollege.appstate.edu/programs/general-education-program/program-goals.

Required E-Textbook and Software: *Discovering Statistics and Data*-3rd *ed.*, James S. Hawkes. This is already included in the rental program, and you do not have to make any additional payment. Please follow the link on AsULearn.

Grading: Grades will be based on assignments, exams, (pop) participation quizzes, and a regression project:

- Assignments will count for 15% of the course grade. They are mostly provided by the Hawkes software and based on the various sections that we will cover throughout the semester. For each assignment, you are expected to attain a certain level of mastery based on the "Certify" option in the software. Depending on the number of certified assignments, your 15% weight will be calculated. For example, if there are 40 assignments out of which you are certified for 38, your assignments will count for (38/40) × 15, i.e., 14.25 in your final grade out of 100.
    - All assignments will have a strict deadline and will be made available on the Hawkes website at least a week in advance.
    - I will excuse five missed assignments.
- Exams will count for 75%.
    - All exams will be posted on Hawkes with a strict deadline. They will only be available on specific dates announced at least a week in advance.
    - The best three (out of four) exams will count for 25% each.
    - Typically, make-up exams will not be given. If you miss one exam, the other three will count towards your grade.
- Participation quizzes will count for 5%.
    - Although make-up quizzes will typically not be given, the lowest grade on one quiz will not count.
- The regression project will count for 5%.
    - I will provide additional details at least a month in advance.
- There is no additional work for extra credit.
- A tentative schedule of due dates is provided below. You will be notified of any changes in advance.

- Late assignments will typically not be accepted. If you are likely to miss an exam due to participation in a university-sponsored activity or religious observance, you should notify me in advance. In case of an emergency, see http://academicaffairs.appstate.edu/syllabi.
- The assignment and exam results will be posted soon after the corresponding deadlines.

At the end of the semester, the final percentage mark will be converted into a letter grade based approximately on the following scale:

Percentage: Grade	Percentage: Grade	Percentage: Grade
93-100: A	80-82: B-	67-69: D+
90-92: A-	77-79: C+	63-66: D
87-89: B+	73-76: C	60-62: D-
83-86: B	70-72: C-	0-59: F

Hawkes Support:
- Phone – 843.571.2825
- Support Request – http://support.hawkeslearning.com/supportcenter/
- Chat – http://support.hawkeslearning.com/supportcenter/ (available 24 hours a day, 7 days a week)

University Tutoring Services: You can always email me to get your doubts clarified. However, feel free to check the following links: https://studentlearningcenter.appstate.edu/tutoring.

Please visit http://academicaffairs.appstate.edu/syllabi for university policies pertaining to academic integrity, disability accommodations, religious observance, attendance, and student engagement.

It is your responsibility to make sure that you are officially registered for this course. If you are not officially registered, please do not expect to be added late.

Class Schedule:

Delivery Method: For each topic, we will have class lectures. The slides posted on AsULearn are incomplete. If an in-person class needs to be canceled, I will provide a substitute video lecture.

Assessment: Assignments pertaining to each topic will be made available on the Hawkes website.

Material	**Date**
Course Introduction	January 17
Chapter 4: Describing and Summarizing Data from One Variable 4.1 Measures of Location 4.2 Measures of Dispersion 4.3 Measures of Relative Position 4.6 Proportions and Percentages *Assignments on the above sections are due on February 2.*	 January 22 January 24

Chapter 5: Discovering Relationships 5.1 Scatterplots and Correlation *Assignment on the above section is due on February 2.*	 January 29
Chapter 8: Continuous Probability Distributions 8.2 The Normal Distribution 8.3 The Standard Normal Distribution 8.4 Applications of the Normal Distribution *Assignments on the above sections are due on February 9.*	 January 31 February 5
Chapter 9: Samples and Sampling Distributions 9.1 Random Samples 9.2 Introduction to Sampling Distributions 9.3 The Distribution of the Sample Mean and the Central Limit Theorem 9.4 The Distribution of the Sample Proportion *Assignments on the above sections are due on February 16.*	 February 7 February 12
Chapter 10: Estimation: Single Samples 10.1 Point Estimation of the Population Mean 10.2 Interval Estimation of the Population Mean 10.3 Estimating the Population Proportion *Assignments on the above sections are due on February 20.*	 February 14 February 19
Exam 1 (on Chapters 4, 5, 8, 9, and 10)	February 21

Chapter 11: Hypothesis Testing: Single Samples 11.1 Introduction to Hypothesis Testing 11.2 Testing a Hypothesis about a Population Mean 11.3 The Relationship between Confidence Interval Estimation and Hypothesis Testing 11.4 Testing a Hypothesis about a Population Proportion 11.6 Practical Significance vs. Statistical Significance *Assignments on the above sections are due on March 15.*	 February 26 February 28 March 4
Chapter 12: Inferences about Two Samples 12.1 Inference about Two Means: Independent Samples 12.2 Inference about Two Means: Dependent Samples (Paired Difference) 12.3 Inference about Two Population Proportions *Assignments on the above sections are due on March 26.*	 March 6 and 18 March 20 March 25
Exam 2 (on Chapters 11 and 12)	March 27
Chapter 5: Discovering Relationships 5.2 Fitting a Linear Model 5.3 Evaluating the Fit of a Linear Model *Assignments on the above sections are due on April 19.*	 April 1
Chapter 13: Regression, Inference, and Model Building 13.1 Assumptions of the Simple Linear Model 13.2 Inference Concerning the Slope Coefficient *Assignments on the above sections are due on April 19.*	 April 3 April 8

Chapter 14: Multiple Regression 14.1 The Multiple Regression Model 14.2 The Coefficient of Determination 14.3 Interpreting the Coefficients of the Multiple Regression Model 14.4 Inference Concerning the Multiple Regression Model and its Coefficients 14.6 Multiple Regression Models with Qualitative Independent Variables *Assignments on the above sections are due on April 30.*	 April 10 April 15 April 17 April 22
Regression project.	April 24
Due date for regression project.	April 29
Exam 3 (on Chapters 13 and 14)	May 1
Exam 4 (on Chapters 4, 5, 8, 9, 10, 11, 12, 13 and 14)	May 6

Note: The schedule above may have to be modified as the semester progresses.

Learning Objectives:

Chapter 4: Describing and Summarizing Data from One Variable

1. Reviewing some measures of central tendency and dispersion.
2. Reviewing z-scores.

Chapter 5: Discovering Relationships

1. Create a scatter plot and calculate the correlation coefficient.
2. Determine if two variables have a positive, negative, or no correlation.

Chapter 8: Continuous Probability Distributions

1. Determine probabilities corresponding to a normally distributed random variable.
2. Determine values of a normal variable given probabilities.
3. Convert any normally distributed variable to the standard normal distribution.

Chapter 9: Samples and Sampling Distributions

1. Discuss the Central Limit Theorem for population means and proportions.

Chapter 10: Estimation: Single Samples

1. Determine point estimates for population means and proportions.
2. Construct a confidence interval for population means and proportions.
3. Determine the minimum sample size for a confidence level.
4. Determine the *t* distribution value given a corresponding probability.

Chapter 11: Hypothesis Testing: Single Samples

1. Conduct hypotheses tests for population means and proportions.
2. Interpret the conclusion to a hypothesis test.
3. Determine p-values, test statistics, and confidence intervals.

Chapter 12: Inferences about Two Samples

1. Construct confidence intervals for two population means.
2. Perform hypotheses tests for two population means.
3. Construct confidence intervals for two population proportions.
4. Perform hypotheses tests comparing two population proportions.

Chapter 5: Discovering Relationships

1. Introduce linear regression models.

Chapter 13: Regression, Inference, and Model Building

1. Interpret linear regression models.
2. Test hypotheses about the slope and intercept coefficients of a regression model.
3. Calculate confidence intervals for linear regression models.

Chapter 14: Multiple Regression

1. Use multiple regression models.
2. Interpret the coefficient of determination.
3. Determine critical F-values.
4. Calculate confidence intervals for multiple regression models.
5. Interpret the results of a regression that uses dummy variables.