

**Huntingdon College
Adult Degree Completion Program**

**COURSE NUMBER: BUS329
Foundations of Quantitative Methods
Spring 2009, Session III, Pell City**

INSTRUCTOR'S NAME: Dr. Howard Clayton

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COURSE DESCRIPTION: Descriptive Statistics; probability and probability distribution; statistical inferences and hypothesis testing; simple regression analysis. Also, the course will cover various statistical applications in quality control, marketing, finance, economics, and other areas of business.

PREREQUISITE: None

TEXT REQUIRED:

Doane, David and Seward, Lorie, Essential Statistics in Business and Economics, (see **Huntingdon College booklist for edition and ISBN**)

COURSE LEARNING OUTCOMES:

Week 1: Methods for Describing Data and Probability

This portion of the module is an introduction to describing data sets, probability theory and discrete and continuous random variables. Upon completion students will be able to utilize native Excel and/or the MegaStat Excel add-in to:

1. Describe categorical data with frequency distribution tables, bar charts, and pie charts.
2. Describe quantitative data with frequency distribution tables, dot plots, and histograms.
3. Generate and interpret measures of central tendency and dispersion for quantitative variables.
4. Describe quantitative data with a five-number summary and related box-whisker plot.
5. Describe linear relationships between two variables with a scatter-plot
6. Explain how to assign probabilities.
7. Use a contingency table to find probabilities.

Week 2: Random Variables and Probability Distributions

This portion of the module is an introduction to the two types of random variables and probability distributions. Upon completion students will be able to:

1. Distinguish between the two types of random variables.
2. Compute the expected value & variance of discrete random variables.
3. Describe the Binomial.

4. Calculate probabilities for Binomial random variables using tables or an Excel function.
5. Describe the Normal random variable.
6. Calculate probabilities for Normal random variables using tables or an Excel function.
7. Calculate the value of a Normal random variable given an associated probability.

Week 3: Statistical Inference; Confidence Intervals & Hypothesis Testing

This portion of the module is an introduction to statistical inference: confidence intervals and hypothesis testing. Upon completion students will be able to:

1. Compute a confidence interval for a population mean assuming the population standard deviation is unknown, using tables or MegaStat.
2. Interpret the meaning of a confidence interval using managerial language.
3. Formulate the null and alternative hypotheses used in hypothesis testing for a population mean.
4. Identify Type I and Type II errors.
5. Conduct one-tailed and two-tailed hypothesis tests for a population mean, assuming unknown sigma and using t-tables or MegaStat.
6. Obtain and interpret the observed significance level (p-value) for a one-tailed or two-tailed statistical test, using MegaStat.
7. Conduct hypothesis tests for the difference between two population means with the aid of native Excel or MegaStat and interpret the results within a business context.

Week 4: Linear Regression

This portion of the module is an introduction to linear regression. Upon completion students will be able to:

1. Obtain the equation for the least-squares regression line through a set of data points, using native Excel or MegaStat.
2. Interpret, within a business context, the meanings of slope and intercept of a least squares regression line.
3. Obtain a confidence interval for the linear regression slope, using native Excel or MegaStat and interpret the meaning of the interval.
4. Obtain the coefficient of correlation and the coefficient of determination for linearly related bivariate data, using native Excel or MegaStat and interpret the coefficients within a business context.
5. Use the least-squares regression line for estimation and prediction.

Week 5: Term Project

In this portion of the module students are expected to be able to conduct data analysis using the appropriate tool with the aid of either native Excel or MegaStat. Upon completion students will be able to:

1. Select the correct numerical and graphical method for summarizing variables depending on the data type.
2. Utilize the appropriate probability distribution to compute probabilities within a business context.

3. Conduct the appropriate inference procedure (estimation or hypothesis test) to answer pertinent questions within a business context.
4. Generate linear regressions and interpret the computer output involving slope, intercept, prediction/confidence intervals, coefficients of correlation and determination, to answer pertinent questions within a business context.

Grading Elements	Percentage:
Weekly Assignments and Homework:	50%
Final project: Written Report	35 - 40%
Final Exam (Mult. Choice based on project)	10%
Class Participation:	<u>0 - 5%</u>
Total	100%

GRADE POINT EQUIVALENTS - Describe the point range for each letter grade.

- A = 75 -100
- B = 60 -74
- C = 50 - 59
- D = 40 - 49
- F = 0 - 39

ATTENDANCE POLICY:

Absences and Tardiness – All students are required to attend the first session.

Those who do not attend the first session will be automatically dropped from the course. Students with more than one absence will receive an "F" for the course. Since this class meets only five times, missing a single class meeting is equivalent to missing three weeks of a regular term. If you cannot attend a class you must let the instructor know via email as soon as possible. In case of absences you are responsible for obtaining all handouts and assignments. Tardiness may result in a deduction in your class participation grade. Excessive tardiness may count as an absence.

Participation – Participation is not the same as attendance. Participation requires students to come to class prepared to actively participate, which makes the classroom experience more meaningful. However, participation is not just speaking out in class. The contributions made by the student should be related to the course content and meaningful to the class discussion.

Late Assignments – Explain whether late assignments will be accepted and what penalty might be imposed if the assignment is late. Also specify what assignments can be turned in late. This will allow the student to make informed decisions.

Accommodation of Special Needs - Huntingdon College makes every reasonable accommodation for disabilities that have been processed and approved through our Disability Services Committee in accord with the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. In order to request disability-related services at Huntingdon College, students must self-identify to the Disabilities Intake Coordinator, Camilla Irvin, and provide appropriate and up-to-date documentation to verify their disability or special needs. After the accommodations have been approved by the Disability Services Committee, the 504 Coordinator, Dr. Lisa Olenik, will notify your professor(s) of the committee's decision. If you have any questions regarding

reasonable accommodation or need to request disability-related services, please contact Disability Services at (334) 833-4432 or e-mail at disabilityservices@huntingdon.edu.

Academic Honesty – Plagiarism is literary theft. Failure to cite the author of any language or of any ideas *which are not your own creation* is plagiarism. This includes any text you might paraphrase, as well. Anyone is capable of searching the Internet or any printed media; your research paper is intended to broaden your knowledge, stimulate your creativity, and make you think, analyze, and learn. It is not consistent with the College Honor Code, nor with scholarly expectations to submit work which is not the product of your own thinking and research. Severe penalties will result upon the submission of any work found to be plagiarized, including potential failure of the entire course. It is easy and simple to properly cite all sources used in your paper. Take no risks – cite your sources.

COURSE ASSIGNMENTS

Week 1:

Read chapters 1, 2, 3, 4, 5.1, 5.2

Homework: Using Excel, generate graphs, charts, and descriptive statistics for categorical and quantitative variables in a non-trivial data set involving 200 or more observations. Draw simple conclusions from the computer output. Data can be downloaded and distributed from an appropriate Internet site (see p. 56)

Week 2:

Read chapters 6 and 7

Homework: 6.4, 6.6, 6.40, 6.44, 6.46, 7.24, 7.26, 7.20

Week 3:

Read Chapters/Sections 8.4, 8.5, 9.1, 9.4, 10.1, 10.3

Homework 8.6, 8.14, 9.28, 9.30, 9.44, 9.56, 10.46, 10.18

Week 4:

Read Chapter 12

Homework 12.4 (a,b), 12.8, 12.18, with dataset A (p. 472) 12.31-37a & 12.42

Week 5:

Reading: review all relevant chapters in preparation for comprehensive case analysis

Final exam mini-case analysis: Dataset and questions covering all chapters to be provided in a separate file (see example attached)