COURSE INFORMATION

COURSE TITLE:
BUS226: Business Statistics

COURSE DESCRIPTION:
Focuses on statistical study, descriptive statistics, probability, binominal distribution, index numbers, time series, decision theory, confidence intervals, linear regression, and correlation. Intended for the business major.

CREDIT HOURS:
3

CCCOonline Course Policies

The CCCOnline Course Policies page contains information about the student’s role in the classroom, grading policies, and rights and responsibilities.
COURSE MATERIALS

Your textbook is available online as an eText. You do not need to purchase any additional materials. For specific information on refund policies and the optional black and white textbook available for purchase please contact the CCCOnline bookstore.

MINIMUM COMPUTER REQUIREMENTS

To complete this course, you will need regular access to a computer from which you can get to the Internet and use email. In order to ensure that your course functions properly, you must run the System Check. This is a CRITICAL STEP, and taking the time to do it now will eliminate a tremendous amount of frustration for you later. To run the System Check, click Tools in the course NavBar and then click System Check.

REQUIRED ETEXT

MAIN eTEXT


DIGITAL MATERIALS ACCESS AND SETUP

This course uses MyLabsPlus which contains the eText in addition to interactive media content to help you remember what you learn.

- Visit the Pearson MyLabsPlus Course Start page for details on first access of the materials.

To make sure your computer is set up correctly to access the eText and other digital content, review the Pearson Technical Support page, also linked in the Technical Support Module.

TECHNOLOGY

You need to use appropriate technology for this course. For most students, Microsoft Excel works the best. This is because in most business situations, Excel will be the commonly available and/or used. You do NOT need to purchase Excel for this course however. Your home college and CCCO offers Microsoft Office 365 for free download and installation.

In many cases, you don’t want to mess around with the individual Excel functions.

- For Windows Excel, there is a statistical application, Data Analysis Toolpak, that permits you to accomplish lots of calculations speedily.
• For Mac Excel users, StatsPlus is a free software package that accomplishes the same task.

Information on obtaining and using these statistical packages is in Module 1 Content.

Besides Excel for Windows or Macs, there is also an Excel clone provided to you in MyLabsPlus. This software is called StatCrunch and works pretty much the same as Excel.
COURSE COMPETENCIES AND OUTCOMES

STUDENT COMPETENCIES:

The competencies you will demonstrate in this course are as follows:

A. Describe the nature and implication of basic principles of statistics and how they play an important role in our daily lives.
B. Organize and summarize data, and represent graphically the important information contained in a data set.
C. Compute numerical quantities that measure the central tendency and dispersion of a set of data.
D. Understand the basic properties of probability.
E. Determine probabilities using postulates, rules of probability and various probability distribution tables.
F. Distinguish between discrete and continuous variables.
G. Compute the mean and standard deviation of a probability distribution.
H. Test hypotheses by using the appropriate distribution and constructing confidence intervals about means, standard deviations, and proportions.
I. Use methods for estimating some population parameters.
J. Understand and apply the basic concepts of statistical inference to the decision making process.
K. Fit a least-square line to a set of data and interpret the coefficient of correlation.
L. Use a statistical software package in performing statistical computations.

The module outcomes that will permit you to demonstrate course competencies are:

MODULE 1

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Define basic concepts and vocabulary of statistics.</td>
<td>A, F</td>
</tr>
<tr>
<td>2  Use data to construct tables and charts for qualitative (categorical, word-based) and quantitative (numerical) data.</td>
<td>B</td>
</tr>
<tr>
<td>3  Calculate measures of central tendency and variation for quantitative variable.</td>
<td>C, L</td>
</tr>
<tr>
<td>4  Evaluate the symmetry/skewness of a set of data.</td>
<td>B, C</td>
</tr>
</tbody>
</table>
MODULE 2

Outcomes

1. Use data to construct tables and charts for qualitative (categorical, word-based) and quantitative (numerical) data.
2. Master and understand basic probability concepts.
3. Identify and calculate conditional probabilities.
4. Construct a probability distribution to compute expected value (mean) and variance of a probability distribution.
5. Compute probabilities from normal distribution.
6. Use the standard normal distribution to solve business problems.
7. Use statistics software application for calculations.

Competencies

B, D, F, E, G, E, L, L

MODULE 3

Outcomes

1. Compute probabilities related to the sample mean and the sample proportion.
2. Understand the importance of the Central Limit Theorem in sampling from non-normally distributed populations.
3. Construct and interpret confidence interval estimates for the mean and the proportion.
4. Determine the sample size necessary to develop a confidence interval estimate for the mean or proportion.
5. Use statistics software application for calculations.

Competencies

E, I, I, J, H, I, J, L

MODULE 4

Outcomes

1. Evaluate, using hypothesis testing, the difference between:
   a. population mean and sample mean,
   b. means of two independent populations,
   c. means of two related populations,
   d. population proportion and sample proportion,
   e. proportions of two independent populations, and
   f. means of more than two populations.
2. Differentiate the types of statistical testing that can be conducted on two or more samples.
3. Use statistics software application for calculations.

Competencies

H, L, H, J, L

MODULE 5

Outcomes

1. Predict the value of a dependent variable using linear regression analysis.
2. Evaluate assumptions of linear regression analysis.
3. Use basic concepts and vocabulary of statistics.
4. Use statistics software application for calculations.

Competencies

GRADING AND EVALUATION

METHODS:

Evaluation includes a combination of discussion participation, assignments, and other evaluations. Rubrics are provided for assignments and discussions.

GRADING POLICIES:

Mark all Module due dates on your calendar for this class. You may submit assignments AHEAD of schedule. Late assignments may not be accepted without prior approval but at the instructor's discretion.

SUMMARY OF GRADING

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussions – Individual (5 @ 15 points each)</td>
<td>75</td>
<td>7.5%</td>
</tr>
<tr>
<td>Discussions – Small Group (5 @ 10 points each)</td>
<td>50</td>
<td>5%</td>
</tr>
<tr>
<td>Practice Problems (5 @ 10 points each)</td>
<td>50</td>
<td>5%</td>
</tr>
<tr>
<td>Application Problems (5 @ 25 points each)</td>
<td>125</td>
<td>12.5%</td>
</tr>
<tr>
<td>Practical Project Portfolio Contributions (5 @ 20 points each)</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes (5 @ 40 points each)</td>
<td>200</td>
<td>20%</td>
</tr>
<tr>
<td>Tests (5 @ 100 points each)*</td>
<td>400*</td>
<td>40%</td>
</tr>
</tbody>
</table>

**TOTAL** 1000 100%

* Five tests are taken but the lowest score is dropped.

Grading Scale

A = 90 to 100%   B = 80 to 89%   C = 70 to 79%   D = 60 to 69%   F = 59% and below

DISCUSSIONS

Two formats for discussions are used, individual and small group.

- For the individual topic-based discussion, the student will post one original post addressing the topic and two substantive posts on separate days in reply to other students.
- In the small group discussion, students are expected to have dialogue with their peers in evaluating the situation presented. (Small group assignments will be made by the instructor.)
- See Course Rubrics for discussions in the Syllabus.
PRACTICE AND APPLICATION PROBLEMS

There is one set each of practice and application problems for each module. Each student will be responsible for completing these problems by the due dates in the MyLabsPlus Homework online environment. The questions chosen for practice and application problems are intentionally very similar to help the learning process. The instructor will provide feedback, addressing deficiencies, in the MyLabsPlus online environment and may ask for further work. A student may initiate a discussion seeking help from other students for each set of problems. The student's foci should be on the problem solving process as well as getting the correct answers since the opportunity for "showing your work" is provided.

PRACTICAL PROJECT PORTFOLIO

The project will be constructed in pieces throughout the course of the semester. Please see Course Rubrics for project contributions in the Syllabus.

QUIZZES

One quiz per module will be completed in MyLabsPlus with a goal of providing correct answers to concept questions and problem calculations. The problems chosen for quizzes and tests are from a different set of questions in MyLabsPlus than for practice and application problems so that authentic assessment can be made. Feedback will be provided by the instructor within the MyLabsPlus online environment and it is the student's responsibility to review that before taking the test.

TESTS

One test per module will be completed in MyLabsPlus with the lowest score of the five dropped in calculating a final course grade. The objective is to provide correct answers to concept questions and problem calculations.

EXTRA CREDIT

There are several forms of extra credit available all of limited value.

- Near mid-semester, CCCO offers to students a Mid-Semester course survey. If more than 50% of the class members participate, extra credit will be awarded to all students in the section.
- Toward the end of the semester, a course discussion will open in which students are asked to post what they have learned from this course and offer suggestions for improvement of the course.
- Finally, if a student performs in an exemplary manner on occasion or throughout the course, extra credit may be awarded, at the instructor's discretion.
PRACTICAL PROJECT PORTFOLIO CONTRIBUTIONS

GRADING RUBRIC

Points assigned are maximum that can be earned for that item. Note that an example of each module's contribution is contained in each module.

MODULE 1 CONTRIBUTION TO PROJECT = 20 POINTS

1. Coversheet with name of project and student(s) = 1 point
2. Purpose of the project (describing the question asked) = 2 points
3. State how, when, and where data was collected = 3 points
4. List of raw data pairs = 1 point
5. Frequency distribution (table) = {leave blank; to be completed in Module 2}
6. Histogram = {leave blank; to be completed in Module 2}
7. Relative percentage polygon = {leave blank; to be completed in Module 2}
8. Sample mean = 1 point
9. Sample median = 1 point
10. Sample mode(s) = 1 point
11. Sample range = 1 point
12. Sample variance = 2 point
13. Sample standard deviation = 2 points
14. Coefficient of variation = 2 points
15. Z-scores = 3 points
16. Initial analysis of data = {leave blank; to be completed in Module 2}
**MODULE 2 CONTRIBUTION TO PROJECT = 20 POINTS**

1. Coversheet with name of project and student(s) = {previously completed in Module 1}
2. Purpose of the project (describing the questions asked) = {previously completed in Module 1}
3. State how, when, and where data was collected = {previously completed in Module 1}
4. List of raw data pairs = {previously completed in Module 1}
5. Frequency distribution (table) = 4 points
6. Histogram = 4 points
7. Relative percentage polygon = 2 points
8. Sample mean = {previously completed in Module 1}
9. Sample median = {previously completed in Module 1}
10. Sample mode(s) = {previously completed in Module 1}
11. Sample range = {previously completed in Module 1}
12. Sample variance = {previously completed in Module 1}
13. Sample standard deviation = {previously completed in Module 1}
14. Coefficient of variation = {previously completed in Module 1}
15. Z-scores = {previously completed in Module 1}
16. Initial analysis of data = 5 points

**PLUS CORRECTIONS/IMPROVEMENTS TO THE MODULE 1 CONTRIBUTION ITEMS:**

**Level A = 4 -5 points:** For Module 1 contribution, student made all corrections and improvements as identified by the instructor and/or made adjustments on their own.

**Level C = 3-4 points:** For Module 1, student made some corrections and improvements as identified by the instructor and/or made adjustments on their own.

**Level F = 0-2 points:** For Module 1, student made none of the corrections and improvements as identified by the instructor and/or made adjustments on their own.

**MODULE 3 CONTRIBUTION TO PORTFOLIO PROJECT = 20 POINTS TOTAL**

1. Project contributions for Modules 1 & 2 including improvements made in Module 2 = 5 points
2. State 1) your sampling frame, 2) the sampling method you used, and 3) suggestions for improvement if you were to take your sample over = 5 points (Hint: review Chapter 1 Powerpoint slides #25-37 or e-text p. 16-21.)
3. Create 95% confidence interval for population mean when population standard deviation is unknown and state the meaning of this interval for your data = 5 points
4. Determine revised sample size for mean using sampling error $e$ of student’s choice (and make sure to state why you chose that particular value for your acceptable sampling error) = 5 points (Hint: see middle of e-text p. 266.)

**MODULE 4 CONTRIBUTION TO PORTFOLIO PROJECT = 20 POINTS TOTAL**

1. Project contributions for Modules 1, 2, and 3. = 5 points
2. Complete one-sample $t$ test of hypothesis when the population standard deviation is unknown (using a population mean value $\mu$ which is provided by instructor in the feedback to Module 3 Project Contribution) distinctly showing the steps using one of these processes:
   a. the “6 Steps of Hypothesis Testing” using critical values as shown in publisher Powerpoint Chapter 9 slides #22-27, 36-40, and 45-51 or as seen in e-text p. 291-292 and p. 297-300; or
   b. “The 5 Step p-value approach to Hypothesis Testing” as shown in publisher Powerpoint Chapter 9 slides #28-34, #42, and 52-53 or as seen in e-text p. 292-294 and p. 300.

   Demonstrated use of one of these processes is worth up to 15 points.

**MODULE 5 CONTRIBUTION TO PORTFOLIO PROJECT = 20 POINTS TOTAL**

Finalize your data results and statement of what you learned from your data about your data (you will "give the data a voice") = 20 points (Note that this is NOT where you summarize what you learned in this course.)
COURSE SCHEDULE
The Schedule is subject to change as needed.

This page summarizes all of the graded assignments, exams, and reading assignments for the course. If you want, you can print it out and post it somewhere handy.

All assignments are described in detail on the Module assignment pages. If you have questions check there and/or send me an e-mail.

This course is not self-paced and is not open-exit. All assignments, papers, quizzes, discussions, etc., are to be completed by no later than 11:59 pm MST/MDT of the due date.

NOTE: Important CCCOnline semester dates (e.g., drop/withdraw/term end) appear on the CCCOnline calendar.

MODULE 1

Reading/Assignments/Exams
Discuss: Student Introductions
Read/View:
- Publisher Powerpoints: Getting Started, Chapters 1, 2, and 3
- Module Explorations & Tutorials
- Appendices A, B, D.1 and D.6, and G.2
- Chapters 1, 2, and 3 (use as supplemental material)
Discuss: Use of Statistics in the Media (view rubric)
Do: Module 1 Practice Problems
Discuss: Measures of Central Tendency, Variability, and Skewness by small group (view rubric)
Do: Module 1 Application Problems
Do: Module 1 Project Contribution (please review the project contributions grading sheet)
Do: Quiz #1
Do: Test #1

MODULE 2

Reading/Assignments/Exams
Read/View:
- Publisher Powerpoints: Chapters 4, 5, and 6
- Module Explorations
- Chapters 4, 5, and 6 (use as supplemental material)
Discuss: The Empirical Rule (view rubric)
Do: Module 2 Practice Problems
Discuss: Normal Distribution by small group (view rubric)
Do: Module 2 Application Problems
Do: Module 2 Project Contribution (please review the project contributions grading sheet)
Do: Quiz #2
Do: Test #2
MODULE 3

Reading/Assignments/Exams
Read/View:
• Publisher Powerpoints: Chapters 7 and 8
• Module Explorations
• Chapters 7 and 8 (use as supplemental material)
Discuss: The Metrics (view rubric)
Do: Module 3 Practice Problems
Discuss: Confidence Interval of a Proportion by small group (view rubric)
Do: Module 3 Application Problems
Do: Module 3 Project Contribution (please review the project contributions grading sheet)
Do: Quiz #3
Do: Test #3

MODULE 4

Reading/Assignments/Exams
Read/View:
• Publisher Powerpoints: Chapters 9 and 10
• Module Explorations
• Chapters 9 and 10 (use as supplemental material)
Discuss: One- and two-sample hypothesis testing (view rubric)
Do: Module 4 Practice Problems
Discuss: One-tail hypothesis testing by small group (view rubric)
Do: Module 4 Application Problems
Do: Module 4 Project Contribution (please review the project contributions grading sheet)
Do: Quiz #4
Do: Test #4

MODULE 5

Reading/Assignments/Exams
Read/View:
• Publisher Powerpoints: Chapter 12
• Module Explorations
• Chapter 12 (use as supplemental material)
Discuss: Regression Analysis (view rubric)
Do: Module 5 Practice Problems
Discuss: Simple Linear Regression by small group (view rubric)
Do: Module 5 Application Problems
Do: Module 5 Project Contribution (please review the project contributions grading sheet)
Discuss: The Course Itself
Do: Quiz #5
Do: Test #5

Last Updated: 8-2-2019 TLT