Applied Business Probability and Statistics

Details	The purpose of this course is to prepare students in mathematical, probability, and statistical concepts for their upcoming studies in quantitative methods. The course is intended for those students who have not had any prior statistical education, although students who have had statistics should also consider taking the course as a refresher.
Credit Hours	4.0
PreRequisites	None
coRequisites	None
Course Add-Ons	Additional Material **Textbook** Statistical Techniques in Business and Economics Lind, D. A., Marchal, W. G., & Wathen, S. A. (2015). Statistical techniques in business and economics (16th ed.). New York, NY: McGraw Hill Education. ISBN-13: 9780078020520 http://gcumedia.com/digital-resources/mcgraw-hill/2014/statistical-techniques-in-business-and-economics_ebook_16e.php **Other** Activating Data Analysis Option (PC Users) Review "Activating Data Analysis Option." **Other** Activating Data Analysis Option (Apple Users) Review "Activating Data Analysis Option." **Other** Statistics Project Overview Throughout this course you will be completing a statistics project for which you will create a data collection instrument, construct data tables from the results, and conduct statistical analysis of the data collected. The assignments for each week build on one another, so it is important to complete each one. Content from each assignment will be used to complete the final Inferential Statistics Hypothesis Testing and Research Summary in Topic 8. The components of the statistics project are listed below along with the schedule for completion. Topic 2: Data Collection Topic 3: Creating a Data Set Topic 4: Descriptive Statistics Topic 5: Confidence Intervals Topic 8: Inferential Statistics Hypothesis Testing and Research Summary **Other** Century National Bank Data

Reference the "Century National Bank Data" as directed to complete the course assignments.

Other
Buena School District Bus Data
Reference the "Buena School District Bus Data" as directed to complete the course assignments.

Other
Baseball 2012 Data
Reference the "Baseball 2012 Data" as directed to complete the course assignments.

Electronic Resource
Excel 2007 Tutorials
Use the links below to access topic specific Excel tutorials: Creating a Pie Chart http://www.mhhe.com/business/ScreencamTutorial/0073521477/Creating_a_PieChart_in_Excel2007/Creating_a_PieChart_in_Excel2007.html Customizing Toolbars http://www.mhhe.com/business/ScreencamTutorial/0073521477/Customizing_Toolbars_in_Excel_2007/Customizing_Toolbars_in_Excel_2007.html Descriptive Statistics http://www.mhhe.com/business/ScreencamTutorial/0073521477/Descriptive_Statistics_in_Excel_2007/Descriptive_Statistics_in_Excel_2007.html Generating Regression Output http://www.mhhe.com/business/ScreencamTutorial/0073521477/Generating_Regression_Output_in_Excel_2007/Generating_Regression_Output_in_Excel_2007.html Installing Data Analysis Toolpak http://www.mhhe.com/business/ScreencamTutorial/0073521477/Installing_Data_Analysis_ToolPak_in_Excel_2007/Installing_Data_Analysis_ToolPak_in_Excel_2007.html Creating Scatter Plot http://www.mhhe.com/business/ScreencamTutorial/0073521477/Creating_Scatter_Plot_in_Excel_2007/Creating_Scatter_Plot_in_Excel_2007.html

Electronic Resource
Excel Statistical Function Tutorials
Use the links below to access topic specific Excel statistical function tutorials: CHIINV Demo http://www.viddler.com/embed/5b2359bd/ FINV Demo http://www.viddler.com/embed/bf88daf9/ NORMINV Demo http://www.viddler.com/embed/dd0ba75d/ TINV Demo http://www.viddler.com/embed/4fc89ffe/

Topics

Topic 1: Understanding Data and Analysis Using Graphs

Duration: 7 days

Description:

Objectives:

1. Discuss the proper use and misuse of data.
2. Define basic statistical terms.
3. Use statistical terms to understand data better.
4. Represent data by constructing graphs, plots, and diagrams.
5. Organize data by frequency distributions.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapters 1 and 2 in Statistical Techniques in Business and Economics.

Website

2. Statistical Information

Explore and become acquainted with the statistical information.

Other

3. Activating Data Analysis Option (PC Users)

Review "Activating the Microsoft Excel 2003 'Data Analysis' Option (PC Users)."

Other

4. Activating Data Analysis Option (Apple Users)

Review "The 'Data Analysis' Option for Apple Users."

Other

5. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Chapter 1 and 2 Practice Problems Complete the problems below from the textbook. You will need to use the "Buena School District Bus Data" file for this assignment. Chapter 1 - Problem 22 Chapter 2 - Problem 53 For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems.	20.0

Gradable Items	Details	Points Possible
	Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	
Discussion Question	Topic 1 DQ 1 The U.S. government keeps statistics on many people in America. One interesting statistic is the poverty rate. To be living in poverty, one must earn income below a certain threshold (approximately $900 per month). Many multimillionaires are included in this statistic. Recently, Barbara Streisand was "living in poverty." In a particular year, she did not perform live, and her album sales were extremely slow. She has a great deal of wealth but had little income that year. Although she has more money than 99.99% of the rest of the population, the government believed that she was impoverished. What other statistic can you name that is misleading? Why?	5.0
Discussion Question	Topic 1 DQ 2 You just saw a commercial for the Tread Master, an exercise machine that claims an average weight loss of 10 pounds. A commercial for the Climber, a competing product, claims that only 1 out of 10 users of the Tread Master lost any weight at all. The rest of them gained weight. How can both of these claims be true?	5.0
Participation		20.0

Topic 2: Descriptive Statistics and Probability

Duration: 7 days

Description:

Objectives:

1. Describe data by using measures of central tendency and dispersion.
2. Explain the role of probability in decision making.
3. Apply addition rules and multiplication rules to solve probability problems.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapters 3-5 in Statistical Techniques in Business and Economics.

Other

2. Century National Bank Data

Reference the "Century National Bank Data" as directed to complete the topic assignment.

Other

3. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Data Collection For the statistics project you are completing in this course, you will need to select a relevant topic that will allow you to gather both qualitative and quantitative data. You may gather data from a group of your choice using a data collection instrument (survey or data mining) that you design. Using the results of that collection instrument, you will create a data set, analyze the data, and create a professional report showing the results of the data that you collected. For this assignment you will choose a topic and create a data collection instrument. When selecting a topic, remember you need to collect both quantitative and qualitative data. Data collection could be done in the form of a survey via a medium such as Survey Monkey or Facebook or through available workplace content such as sales orders. You will want to collect data from approximately 30 observations. This means you will want to survey at least 30 people or select data from 30 different sales orders. Submit the topic of the study, a rationale (one or two paragraphs) outlining the purpose of the study, and the data collection instrument you created as a Word document. Include relevant survey links if the data is being collected digitally. APA format is not required, but solid academic writing is expected. This assignment uses a rubric. Please review the rubric prior to beginning the assignment to become familiar with the expectations for successful completion.	75.0

Gradable Items	Details	Points Possible
	You are not required to submit this assignment to Turnitin.	
Assignment	Chapters 3-5 Practice Problems Complete the problems below from the textbook. You will need to use the "Buena School District Bus Data" and the "Century National Bank Data" files for this assignment. Chapter 3 – Problem 88 Chapter 4 – Problem 25 Chapter 4 – Problem 46 Chapter 5 – Problem 94 Chapter 4 Case A – Century National Bank For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	50.0
Discussion Question	Topic 2 DQ 2 You are looking for a home in a particular neighborhood, and you want to know the typical number of bathrooms and bedrooms, the square footage, and the appraised value of houses in that neighborhood. Which measure of central tendency (mean, median, or mode) would be the most appropriate for each piece of information listed, and why?	5.0
Discussion Question	Topic 2 DQ 1 The definition a probability isstated as: A measure of the likelihood that an event in the future will happen; it can only assume a value between 0 and 1, inclusive. Explain the meaning of the 0 and 1.	5.0
Participation		20.0

Topic 3: Discrete and Continuous Probability Distributions

Duration: 7 days

Description:

Objectives:

1. Determine probabilities associated with binomial and Poisson discrete probability distributions.

2. Determine probabilities associated with the normal distribution.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapters 6 and 7 in Statistical Techniques in Business and Economics.

Other

2. Century National Bank Data

Reference the "Century National Bank Data" as directed to complete the topic assignment.

Other

3. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Other

4. Baseball 2012 Data

Reference the "Baseball 2012 Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Creating a Data Set Administer the data collection tool you created in the Topic 2 assignment. Using the data you collect, create an Excel table and complete the items below. Create two frequency tables based on two separate questions from your survey. Create a bar graph and a pie chart based on the data in the frequency tables. Determine the class intervals and create frequency distribution for each of the frequency tables. Create one frequency polygon of the data from the frequency distribution. Create an individual Excel document for each of the required items. APA format is not required, but solid academic writing is expected. This assignment uses a rubric. Please review the rubric prior to beginning the assignment to become familiar with the expectations for successful completion.	75.0

Gradable Items	Details	Points Possible
	You are not required to submit this assignment to Turnitin.	
Assignment	Chapter 6 and 7 Practice Problems Complete the problems below from the textbook. You will need to use the "Baseball 2012 Data," "Buena School District Bus Data," and the "Century National Bank Data" files for this assignment. Chapter 6 – Problem 45 Chapter 6 – Problem 71 Chapter 7 – Problem 53 Chapter 7 – Problem 55 Chapter 7 – Problem 76 Chapter 7 Case A – Century National Bank For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	60.0
Discussion Question	Topic 3 DQ 2 Describe the term mutually exclusive. Provide some examples. Must the values of x in a discrete probability distribution always be mutually exclusive? Why or why not? Provide an example.	5.0
Discussion Question	Topic 3 DQ 1 Provide some examples of discrete and continuous variables. What attributes of these variables make them discrete and continuous? Why?	5.0
Participation		20.0

Topic 4: Sampling Distribution and Confidence Interval

Duration: 7 days

Description:

Objectives:

1. Describe the major sources of error in survey research.
2. Determine sampling distribution means and proportions for samples from a given population.
3. Use the standard normal distribution to construct a confidence interval for a population mean or proportion.

4. Determine sample size for a mean and sample size for a proportion.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapters 8 and 9 in Statistical Techniques in Business and Economics.

Other

2. Century National Bank Data

Reference the "Century National Bank Data" as directed to complete the topic assignment.

Other

3. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Descriptive Statistics Conduct an analysis of your project data. Prepare the items below based on the data from two of the variables in the data collection instrument. Determine the mean, median, and mode for each of the variables. What is the variance for each set of data for each of the variables? What is the standard deviation for each of the variables? What is the probability that each event occurs in each of the two variables. Create an individual Excel document for each of the required items. Be sure to show your work. APA format is not required, but solid academic writing is expected. This assignment uses a rubric. Please review the rubric prior to beginning the assignment to become familiar with the expectations for successful completion. You are not required to submit this assignment to Turnitin.	75.0
Assignment	Chapter 8 and 9 Practice Problems Complete the problems below from the textbook. You will need to use the "Buena School District Bus Data" and the "Century National Bank Data" files for this assignment.	60.0

Gradable Items	Details	Points Possible
	Chapter 8 – Problem 44 Chapter 8 – Problem 48 Chapter 9 – Problem 56 Chapter 9 – Problem 66 Chapter 9 – Problem 71 Chapter 9 Case A – Century National Bank For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	
Discussion Question	Topic 4 DQ 1 You just saw an ad on television that states the majority of the population would vote to make smoking illegal. The poll that is referenced shows 53% of those asked supported making smoking illegal. In the fine print at the bottom of the screen, you see that the margin of error is +/- 3%. What is your reaction? Explain.	5.0
Discussion Question	Topic 4 DQ 2 As the marketing director of Harley-Davidson, you need to determine what your customers would like in the next model. You put a survey on the Harley website. Is this a good frame from which to select your sample? Explain.	5.0
Participation		20.0

Topic 5: Hypothesis Testing with Single Samples

Duration: 7 days

Description:

Objectives:

1. Use null and alternative hypotheses to determine whether a two-tailed or one-tailed test is appropriate.
2. Identify Type I and Type II errors in hypothesis testing.
3. Use the standard normal distribution to construct a confidence interval for a population mean or proportion.
4. Solve hypothesis test problems for population means, sample means, and population proportions.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapter 10 in Statistical Techniques in Business and Economics.

Other

2. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Other

3. Baseball 2012 Data

Reference the "Baseball 2012 Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Confidence Intervals Create confidence intervals related to the interval and ratio-level data you collected. What is the best estimate of the population mean Develop a 95% confidence interval for the population mean. Develop a 90% confidence interval for the population mean. Develop a 98% confidence interval for the population mean. Interpret the confidence interval. Create an individual Excel document for each of the required items. APA format is not required, but solid academic writing is expected. This assignment uses a rubric. Please review the rubric prior to beginning the assignment to become familiar with the expectations for successful completion. You are not required to submit this assignment to Turnitin.	75.0
Assignment	Chapter 10 Practice Problems Complete the problems below from the textbook. You will need to use the "Baseball 2012 Data" and the "Buena School District Bus Data" files for this assignment. Chapter 10 – Problem 8 Chapter 10 – Problem 13 Chapter 10 – Problem 51 Chapter 10 – Problem 52	40.0

Gradable Items	Details	Points Possible
	For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	
Discussion Question	Topic 5 DQ 1 Your mayor just announced that the local unemployment rate dropped last month from the prior month. It went from 10.5% to 10.4%. Is this a significant drop? Explain.	5.0
Discussion Question	Topic 5 DQ 2 Give an example of a situation in which you believe a Type I Error is more serious than a Type II Error. Give an example of a situation in which you believe a Type II Error is more serious than a Type I Error. In each case, why do you think so?	5.0
Participation		20.0

Topic 6: Hypothesis Testing With Two Samples

Duration: 7 days

Description:

Objectives:

1. State the appropriate hypotheses in comparing the means of two samples.
2. Test for significant difference between sample means from independent populations.
3. Test for significant difference between sample means from dependent populations.
4. Determine whether two independent samples could have come from populations having the same standard deviation.
5. Differentiate between the application of z-tests and t-tests.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapters 11 and 12 in Statistical Techniques in Business and Economics.

Other

2. Century National Bank Data

Reference the "Century National Bank Data" as directed to complete the topic assignment.

Other

3. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Other

4. Baseball 2012 Data

Reference the "Baseball 2012 Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Chapter 11 Practice Problems Complete the problems below from the textbook. You will need to use the "Baseball 2012 Data," "Buena School District Bus Data," and the "Century National Bank Data" files for this assignment. Chapter 11 – Problem 14 Chapter 11 – Problem 41 Chapter 11 – Problem 48 Chapter 11 – Problem 49 Chapter 12 Case A – Century National Bank For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	50.0
Discussion Question	Topic 6 DQ 2 A research firm tracks the average highway speed of 30 drivers driving home on Day 1. For the next 10 days, the drivers are given two cups of coffee 1 hour before the drive home. On the 10th day, the average highway speed is measured again. Does this study involve dependent or independent samples? You are interested in knowing if there is a statistical difference in driving speeds between Day 1 and Day 10. Which statistical test would be appropriate? Why?	5.0
Discussion Question	Topic 6 DQ 1 What does the p-value tell the business statistician, especially in terms of	5.0

Gradable Items	Details	Points Possible
	the normal curve? If the p-value is smaller than the level of significance, what does that mean in terms of the null hypothesis? Why?	
Participation		20.0

Topic 7: Regression and Correlation Analysis

Duration: 7 days

Description:

Objectives:

1. Perform simple regression and correlation analysis.
2. Perform multiple regression analysis.
3.
4.
5.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapters 13 and 14 in Statistical Techniques in Business and Economics.

Other

2. Century National Bank Data

Reference the "Century National Bank Data" as directed to complete the topic assignment.

Other

3. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Other

4. Baseball 2012 Data

Reference the "Baseball 2012 Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Chapter 13 and 14 Practice Problems Complete the problems below from the textbook. You will need to use the "Baseball 2012 Data," "Buena School District Bus Data," and the "Century National Bank Data" files for this assignment. Chapter 13 – Problem 63 Chapter 13 – Problem 64 Chapter 14 – Problem 35	40.0

Gradable Items	Details	Points Possible
	Chapter 14 Case A – Century National Bank For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	
Discussion Question	Topic 7 DQ 2 Compare and contrast Spearman and Pearson correlations.	5.0
Discussion Question	Topic 7 DQ 1 Provide an example of where you could use correlation in real life. Explain why a t-test is necessary before you accept this correlation as being real in the population.	5.0
Participation		20.0

Topic 8: Analysis of Variance and Nonparametric Methods

Duration: 7 days

Description:

Objectives:

1. Apply the one-way ANOVA approach to hypotheses testing.
2. Perform chi-square goodness of fit and test for independence.
3.
4.

Topic Material:

Textbook

1. Statistical Techniques in Business and Economics

Read Chapter 15 and review Chapter 12 in Statistical Techniques in Business and Economics.

Electronic Resource

2. Reflection Before Action: The Statistical Consultant Confronts Ethical Issues

Read "Reflection Before Action: The Statistical Consultant Confronts Ethical Issues," by Ostapski and Superville, located on the University of West Georgia website.

Electronic Resource

3. A Christian View of the Foundations of Statistics

Read "A Christian View of the Foundations of Statistics," by Geertsema, located on the American Scientific Affiliation website.

Other

4. Buena School District Bus Data

Reference the "Buena School District Bus Data" as directed to complete the topic assignment.

Gradable Items	Details	Points Possible
Assignment	Inferential Statistics Hypothesis Testing and Research Summary Conduct an analysis and hypothesis test of your choice on the data you collected. Write a 250-500 word research summary of the findings generated in the assignments for Topics 2 through 5. The research summary should address the following. Explain what type of analysis and hypothesis test was conducted on the data collected. Summarize the survey results based on the results of the data you analyzed. Include the Excel analysis as part of the document. APA format is not required, but solid academic writing is expected. This assignment uses a rubric. Please review the rubric prior to beginning the assignment to become familiar with the expectations for successful completion. You are not required to submit this assignment to Turnitin.	110.0
Assignment	Chapter 12 and 15 Practice Problems Complete the problems below from the textbook. You will need to use the "Buena School District Bus Data" file for this assignment. Chapter 12 – Problem 51 Chapter 15 – Problem 57 Chapter 15 – Problem 64 For problems requiring computations, please ensure that your Excel file includes the associated cell computations and/or statistics output. This information is needed in order to receive full credit on these problems. Submit output in one Excel file. You are not required to submit this assignment to Turnitin.	30.0

Gradable Items	Details	Points Possible
Discussion Question	Topic 8 DQ 1 In ANOVA analysis, what is the real meaning of the term treatment? What does this really mean? Provide some examples of treatments from a business or managerial perspective.	5.0
Discussion Question	Topic 8 DQ 2 How many different tests does the textbook give you for applying the chi-square distribution? What are these tests? How could you use each of these tests at your place of business?	5.0
Participation		20.0

Grade Scale

Letter Grade	GPA Value	Minimum	Maximum	Interpretation of Level of Performance
A	4.0	93.0	100.0	Superior; outstanding scholarship
A-	3.7	90.0	92.99	Superior; outstanding scholarship
B+	3.3	87.0	89.99	Above average; good work
B	3.0	83.0	86.99	Average standard performance
B-	2.7	80.0	82.99	-
C+	2.3	77.0	79.99	Below Standard
C	2.0	70.0	76.99	Below Standard
F	0.0	0.0	69.99	Failure
I	0.0	0.0	0.0	Course work is incomplete
W	0.0	0.0	0.0	Authorized withdrawal; no credit
-	0.0	0.0	0.0	NA
-	0.0	0.0	0.0	NA

Policies

For student policies, please refer to the University Policy Handbook