MIS445 – Statistics & SPSS

Credit Hours: 3

Contact Hours: This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 10-25 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

Course Description and Outcomes

Course Description:

A study of data analysis, data production, and statistical inference. Areas of study include: surveys and designed experiments, randomization, causation, regression, and inference using hypothesis tests. This course also explores using statistical methods for the analysis of data for an enterprise performance and quality, effectiveness, and marketability. SPSS software will be utilized to conduct a predictive analysis, analyze the results, and document the findings.

Course Overview:

This course on Statistics and SPSS provides a survey of classical data analysis methodologies commonly used in many disciplines. These methodologies span from data distributions to data modeling using regression analysis and other procedures. The course is unique in a way that it is coupled with SPSS interface and for every Statistical methodology discussed, it provides corresponding SPSS mechanism of the analysis. The course is designed and written in a way to maximize students learning through easily relatable examples and step-by-step procedure for analysis. The course is organized to build expertise from basic descriptive statistics to more advanced modeling and inference drawing from vast datasets.

Course Learning Outcomes:

1. Describe how findings from statistical studies are used to assess business performance, develop marketing strategies, improve customer service, and formulate strategic plans.
2. Describe the basic concepts of descriptive and inferential statistics, including central tendencies, distributions, sampling, correlations, probability, estimation, and regression analysis.
3. Demonstrate research literacy as critical consumers of research studies.
4. Select the appropriate type of data model to use for the analysis data for enterprise business studies and utilize SPSS software to perform predictive analyses of input data and the types of outputs possible.
5. Describe how to properly interpret the results of an SPSS analysis of data.
6. Document the results of an SPSS analysis in a professional business oriented manner.

**Participation & Attendance**

Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

**Course Materials**

*Textbook Information is located in the CSU-Global Booklist on the Student Portal.*

**Course Schedule**

**Due Dates**
The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- Discussion Boards: The original post must be completed by Thursday at 11:59 p.m. MT and Peer Responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- Opening Exercises: Take the opening exercise before reading each week’s content to see which areas you will need to focus on. You may take these exercises as many times as you need. The opening exercises will not affect your final grade.
- Mastery Exercises: Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- Critical Thinking Activities: Assignments are due Sunday at 11:59 p.m. MT.

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<thead>
<tr>
<th>Week #</th>
<th>Readings</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>1</td>
<td>Chapter 1 in <em>Discovering Statistics using IBM SPSS Statistics</em> (4th ed.)</td>
<td>Discussion (25 points)</td>
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<tr>
<td>2</td>
<td>Chapter 2 in <em>Discovering Statistics using IBM SPSS</em></td>
<td>Discussion (25 points)</td>
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<td>Statistics (4th ed.)</td>
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<tr>
<td>3</td>
<td>Chapter 3 &amp; Sections 4.3 &amp; 5.4.2 in <em>Discovering Statistics using IBM SPSS Statistics</em></td>
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<tr>
<td>4</td>
<td>Chapter 6 in <em>Discovering Statistics Using IBM SPSS Statistics</em> (4th ed.)</td>
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<td>5</td>
<td>Chapters 7 &amp; 18 in <em>Discovering Statistics Using IBM SPSS Statistics</em> (4th ed.)</td>
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<td>6</td>
<td>Chapter 8 in <em>Discovering Statistics Using IBM SPSS Statistics</em> (4th ed.)</td>
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<tr>
<td>7</td>
<td>Chapter 9 in <em>Discovering Statistics Using IBM SPSS Statistics</em> (4th ed.)</td>
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|      | Vasilopoulos, A. (2012). Hypothesis testing: A
Assignment Details

This course includes the following assignments/projects:

Module 3

Critical Thinking: Select only one of the two options below to complete this Critical Thinking Assignment.

Option 1: Exploring SPSS – A paper (90 points)

Open the SPSS data file MonthyCustomerAnalysis_CSUGlobal.sav (available on the Week 3 Critical Thinking Assignment and Course Information page) and identify the following data information:

- From the Data View identify the number of observations for this data file.
- From the Variable View identify 1) the number of variables in this dataset and 2) the meaning of variables Quarter and CreditRating. Have these two variables been coded?
- Use the Data View to determine the type of values for each variable. That is, are they categorical/discrete or numerical/continuous variables? For categorical/discrete types, are they Nominal or Ordinal?
- What variable is being used to code the Temperature_Range variable? What will be the value in Temperature_Range for a temperature of 110?
- Why do you think that Quarter is being coded as a categorical variable, even though it is numbers?
- Perform a frequency analysis of the CreditRating variable. Go to “Analyze” to “Descriptive statistics” to “Frequency” menus. Which credit ratings have the highest frequencies?
- Perform a descriptive analysis of the DollarSales variable. Go to “Analyze” to “Descriptive statistics” to “Descriptive” menus. What is the mean and the standard deviation?
- For all other variables, perform either a frequency analysis or a descriptive analysis.

Based on the output, write a brief report describing the distribution of each variable. Statistics should follow general statements in parentheses as supporting evidence.

Examples of reporting descriptive statistical results:

- A majority of the survey respondents are married (married = 68%, single = 32%).
- The average income of the respondents is $35,000 with the SD = $8,000. The histogram chart shows that income is skewed to the left.

Copy and paste any data or tables into the paper and label each section clearly. Your well-written paper should be 2-4 pages in length.
Follow APA format, according to *CSU-Global Guide to Writing and APA Requirements*. Include a title page and reference page. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

**Option 2: Exploring SPSS – A presentation (90 points)**

Using the option 1 criteria, instead of creating a Microsoft Word document, develop a PowerPoint presentation or use an Internet-based presentation tool such as Prezi or SlideRocket. The presentation must have 8-12 content slides with details in the Notes section. The presentation should clearly describe your data analysis results and conclusions.

- From the Data View, identify the number of observations for this data file.
- From the Variable View, identify 1) the number of variables in this dataset and 2) the meaning of variables Quarter and CreditRating. Have these two variables been coded?
- Use the Data View to determine the type of values for each variable. That is, are they categorical/discrete or numerical/continuous variables? For categorical/discrete types, are they Nominal or Ordinal?
- What variable is being used to code the Temperature_Range variable? What will be the value in Temperature_Range for a Temperature of 110?
- Why do you think that Quarter is being coded as a categorical variable, even though it is numbers?
- Perform a frequency analysis of the CreditRating variable. Go to “Analyze” to “Descriptive statistics” to “Frequency” menus. Which credit ratings have the highest frequencies?
- Perform a descriptive analysis of the DollarSales Variable. Go to “Analyze” to “Descriptive statistics” to “Descriptive” menus. What is the mean and the standard deviation?
- For all other variables, perform either a frequency analysis or a descriptive analysis.

Based on the output, write a brief report describing the distribution of each variable. Statistics should follow general statements in parentheses as supporting evidence.

Examples of reporting descriptive statistical results:

- A majority of the survey respondents are married (married = 68%, single = 32%).
- The average income of the respondents is $35,000 with the SD = $8,000. The histogram chart shows that income is skewed to the left.

Copy and paste any data or tables into the paper and label each section clearly.

Follow APA format, according to *CSU-Global Guide to Writing and APA Requirements*. Include a title slide and a slide citing references. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

**Module 4**

**Critical Thinking:** Select only one of the two options below to complete this Critical Thinking Assignment.

**Option 1: Understanding Non-Parametric Tests – A paper (90 points)**

Using CSU-Global library databases and/or other scholarly articles, develop a 2-3 page review paper using APA format that highlights the use of non-parametric tests in building valid statistical models. Your paper compares the pros and cons of non-parametric tests.

Address the following:

a) Give two examples of the data that would be used in the Wilcoxon Rank-Sum Test and Kruskal-Wallis Test.

b) Analyze how the results from the data input would differ between the Wilcoxon Rank-Sum Test and the Kruskal-Wallis Test.
c) Evaluate how you would use the results from the Wilcoxon Rank-Sum Test and the Kruskal-Wallis Test.

Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title page and reference page. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

**Option 2: Understanding Non-Parametric Tests – A presentation (90 points)**

Select most commonly used non-parametric tests and develop a PowerPoint presentation or an Internet-based presentation tool such as Prezi or SlideRocket. Your presentation compares the pros and cons of non-parametric tests. Your presentations should have 8-12 slides. Each slide must contain notes that explain the points made on the slide.

Address the following in the presentation:

a) Give two examples of the data that would be used in the Wilcoxon Rank-Sum Test and the Kruskal-Wallis Test.

b) Analyze how the results from the data input would differ between the Wilcoxon Rank-Sum Test and the Kruskal-Wallis Test.

c) Evaluate how you would use the results from the Wilcoxon Rank-Sum Test and the Kruskal-Wallis Test.

Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title slide and a reference slide beyond the 8-12 content slides. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

**Module 5**

**Critical Thinking:** Select only one of the two options below to complete this Critical Thinking Assignment.

**Option 1: Understanding Correlation – A paper (90 points)**

1. Download and open the data file Telco_Extra-CSUGlobal.sav (available on the Module 5 Assignments page or the Course Information page).

2. Perform statistical analysis Pearson’s $r$ on “Months with service (tenure)” with “Household Income (income).” Menu steps: “Analyze” menu – Correlate – Bivariate (check the boxes for “Pearson,” “One-tailed,” and “Flag significant correlations”) - OK.

3. Examine the size of the correlation coefficient (Pearson’s $r$) and report on the relationship.

4. If Pearson’s $r$ is significant between some pairs of variables, will it be sufficient evidence for a causal relationship? Explain your reasons.

5. Do you think that the correlation between tenure and income is positive or negative for this data file that contains only adults? Why?

6. Perform statistical analysis Kendall’s tau and Spearman’s rho on “Level of Education” with “Age in Years.” Menu steps: “Analyze” menu – Correlate – Bivariate (check the boxes for “Kendall,” “Spearman,” “One-tailed,” and “Flag significant correlations”) - OK.

7. Examine the size of the correlation coefficient and report on the relationship.

8. Why do you think that we have used a one-tailed test for these?

9. Why do you think that you used Spearman and Kendall’s correlation for age with education, whereas you used the Pearson test for tenure with income?

10. Conduct a Chi-square run to test whether marital status has an influence on the churn rate within the last month.

Clearly report the correlation coefficients and Chi-square results as described in the text (section 7.8 & section 18.5.7, respectively).
Copy and paste any data or tables into the paper and label each section clearly. Your well-written paper should be 2-4 pages in length. Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title page and reference page. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

**Option 2: Understanding Correlation – A presentation (90 points)**

Develop a PowerPoint presentation or use an Internet-based presentation tool such as Prezi or SlideRocket.

1. Download and open the data file Telco_Extra_CSUGlobal.sav (available on the Week 5 Assignments page and the Course Information page.
2. Perform statistical analysis Pearson’s r on “Months with service (tenure)” with “Household Income (income).” Menu steps: “Analyze” menu – Correlate – Bivariate (check the boxes for “Pearson,” “One-tailed,” and “Flag significant correlations”) - OK.
3. Examine the size of the correlation coefficient (Pearson’s r) and report on the relationship.
4. If Pearson’s r is significant between some pairs of variables, will it be sufficient evidence for a causal relationship? Explain your reasons.
5. Do you think that the correlation between tenure and income is positive or negative for this data file that contains only adults? Why?
6. Perform statistical analysis Kendall’s tau and Spearman’s rho on “Level of Education” with “Age in Years.” Menu steps: “Analyze” menu – Correlate – Bivariate (check the boxes for “Kendall,” “Spearman,” “One-tailed,” and “Flag significant correlations”) - OK.
7. Examine the size of the correlation coefficient and report on the relationship.
8. Why do you think that we have used a one-tailed test for these?
9. Why do you think that you used Spearman and Kendall’s correlation for age with education, whereas you used the Pearson test for tenure with income?
10. Conduct a Chi-square run to test whether marital status has an influence on the churn rate within the last month.

Clearly report the correlation coefficients and Chi-square results as described in the text (section 7.8 & section 18.5.7, respectively).

Copy and paste any data or tables into the presentation slides and label each section clearly.

Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title slide and a slide with references. These are in addition to the 8-12 presentation slides. Each slide must contain a “Notes Section” giving a full explanation of the points on the slide. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

**Module 6**

**Critical Thinking:** Select only one of the two options below to complete this Critical Thinking Assignment.

**Option 1: Regression Model – A paper (100 points)**

1. Open the file available on the Course Information page.
2. Your goal is to create a regression model that can predict income based on age in years. Create a linear regression model in SPSS.
3. How good is the overall fit of the income determination model? (Use $R^2$ as well as the F statistics to justify your answer.)
4. Compute the predicted income for a 27-year-old individual.
Option 2: Regression Model – A presentation (100 points)

Using the results from the above-mentioned regression analysis, develop a PowerPoint presentation or use an Internet-based presentation tool such as Prezi or SlideRocket.

1. Open the file available on the Course Information page.
2. Your goal is to create a regression model that can predict income based on age in years. Create a linear regression model in SPSS.
3. How good is the overall fit of the income determination model? (Use $R^2$ as well as the F statistics to justify your answer.)
4. Compute the predicted income for a 27-year-old individual.

Your presentations should have 8-12 slides following APA format and using scholarly citations. Each slide must contain a “Notes Section” with full explanation of the slide’s content. Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title slide and a slide citing references. These are in addition to the 8-12 slides used in the presentation. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.
relationship between the pair of variables. Now determine the level of measurement for each of your independent variables and the dependent variable (in terms of categorical/discrete or continuous/scale).

5. Perform proper bivariate statistical analysis to test each hypothesis.

6. Choose income to be the dependent variable in two hypotheses you will establish. DO NOT USE ANY OF THE HYPOTHESES COVERED IN EARLIER MODULES. Each hypothesis should state clearly the direction of the relationship between the pair of variables. Now determine the level of measurement for each of your independent variables and the dependent variable (in terms of categorical/discrete or continuous/scale).

7. Perform proper bivariate statistical analysis to test each hypothesis.

Report the statistical results observed regarding your hypotheses in existence, strength, and direction of the relationship. Did you uncover any surprises or unexpected findings? Do statistical results support your hypotheses in existence, strength, and direction?

Copy and paste any data, tables, or graphs into the paper and label each section clearly. Your well-written paper should include 8-10 pages of written material plus additional pages as needed to accommodate graphics. Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title page and reference page. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.

Option 2: Developing Models (350 points)

Select a response (dependent) variable of your choice, for example US corn yield in the year 2012, from the USDA site (www.usda.gov); or the gasoline price at pump in the US in 2013; or the current obesity level in the US population from (www.cdc.gov). After learning about this variable and doing some research, identify one or two classification (independent) variable(s) that may be affecting your selected response variable. Your classification (independent) variable may be a quantity or a category. Depending upon your collected data, now perform an adequate analysis. For example, if both of your variables (independent and dependent) are quantitative, then perform correlation and regression analysis; however, if your classification variable is a category and you have more than two means to compare, then perform analysis of variance. In each case, your analysis should be comprehensive, using SPSS, including all the required components of the selected analysis, such as r, R², residuals, forecast equation (y = intercept + slope * x; where y is response (dependent) variable and x is independent variable). In the case of ANOVA, develop an appropriate table and test your hypothesis.

In either analysis, determine if there exist other variables (confounding or lurking) that may be significantly affecting your model outcome.

Your well-written paper should include 8-10 pages of written material plus additional pages as needed to accommodate graphics. Follow APA format, according to CSU-Global Guide to Writing and APA Requirements. Include a title page and reference page. Use outside academic sources other than the textbook, course materials, or other information provided as part of the course materials. The CSU-Global Library is a good place to find these sources.
In-Classroom Policies
For information on late work and incomplete grade policies, please refer to our In-Classroom Student Policies and Guidelines or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

Academic Integrity
Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing/re-purposing your own work (see CSU-Global Guide to Writing and APA Requirements for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

Citing Sources with APA Style
All students are expected to follow the CSU-Global Guide to Writing and APA Requirements when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the “APA Guide & Resources” link. A link to this document should also be provided within most assignment descriptions on your course’s Assignments page.

Disability Services Statement
CSU–Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette
Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom.

If you have concerns about something that has been said, please let your instructor know.

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>C+</td>
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<td>C</td>
<td>70.0 – 74.9</td>
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<td>D</td>
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<tr>
<td>F</td>
<td>59.9 or below</td>
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The CSU-Global Guide to Writing and APA Requirements contains information on the guidelines and requirements for APA citations, including the 6th edition of the APA Style Manual, and is accessible through the CSU-Global Library resources.