BSAD 2340 - Data Analysis & Decision Making

Course Syllabus

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Office Hours: 9 – 10 & 1-2 MWF and 10-noon T-Th

Course Description
Students will learn quantitative decision making skills for managers. Particular focus will be given to understanding statistics and management science concepts, and developing the skills required to analyze data, conduct statistical hypothesis testing, and use management science techniques in business settings.

Prerequisites and Curriculum Program Requirement
Math 1730 or higher. Must meet Excel competency requirement.

Learning Outcomes:
On completion of this course, students will be able to:
* Describe the properties of normal, binomial, Poisson, and exponential distributions, provide examples of when they apply, and perform calculations involving them;
* Discriminate between sampling schemes that are generally used in real sampling applications;
* Analyze sample data in order to infer the properties of the entire population;
* Construct and analyze data files using Excel;
* Evaluate data using tables, graphs, and descriptive statistics;
* Analyze a single sample of data using hypothesis testing;
* Investigate differences in two or more samples using hypothesis testing;
* Assess relationships between variables using hypothesis testing;
* Perform forecasting scenarios using historical data;
* Analyze decision problems that involve uncertainty;
* Apply linear programming techniques to business decisions;
* Understand how to test the assumptions associated with statistical hypothesis tests; and
* Apply statistical analysis and management science techniques to decision making situations.


Concepts covered:
* Probability and data distributions;
* Statistical techniques, including conducting descriptive statistical analyses, creating graphical data displays and tables, confidence intervals, and hypothesis testing;
* Management Science techniques, including decision making under uncertainty, time series analysis, forecasting, optimization, and simulation;
* How to make decisions based on quantitative data analysis; and
* How to use Excel to conduct all the analyses listed above.

**Activities**

**Homework Problems:** Students will complete homework problems from the text using Excel.

**Quizzes & Exams:** Quiz and exam material will be based on the text, class lecture, and discussion. Quizzes will consist of definitions and short answers to questions. Exams will require students to complete data analysis problems similar to the homework and use the results of the analyses to make decisions.

**In-class Hands-on Activities:** As concepts are presented, hands on exercises will be completed in class to help students apply the concept.

**Unit Projects:** Unit projects will focus on the application of the analysis techniques covered in the unit to a hypothetical business situation in order to make a decision. Students will work individually and/or in teams to complete a data analysis and decision making project that will be presented to the class.

**Assessments:**

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<thead>
<tr>
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<th>Percent of Grade</th>
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<tbody>
<tr>
<td>Lesson Homework Problems</td>
<td>20%</td>
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<tr>
<td>Lesson Quizzes</td>
<td>15%</td>
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<tr>
<td>Unit Exams</td>
<td>40%</td>
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<td>Unit Projects</td>
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<tr>
<td>In-class Hands-on Activities</td>
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**Course Content:**

**Unit 1 Introduction to Data Analysis & Decision Making and Exploring Data**
- Lesson 1 Introduction to Data Analysis and Decision Making
- Lesson 2 Describing the Distribution of a Single Variable
- Lesson 3 Finding Relationships among Variables

**Unit 2 Probability and Decision Making under Uncertainty**
- Lesson 4 Probability and Probability Distributions
- Lesson 5 Normal, Binomial, Poisson, and Exponential Distributions
- Lesson 6 Decision Making under Uncertainty

**Unit 3 Statistical Inference**
- Lesson 7 Sampling and Sampling Distributions
- Lesson 8 Confidence Interval Estimation
- Lesson 9 Hypothesis Testing
**Unit 4 Regression Analysis and Time Series Forecasting**
- Lesson 10 Regression Analysis: Estimating Relationships
- Lesson 11 Regression Analysis: Statistical Inference
- Lesson 12 Time Series Analysis and Forecasting

**Unit 5 Optimization, Simulation Modeling, and Advanced Data Analysis**
- Lesson 13 Introduction to Optimization Modeling
- Lesson 14 Optimization Models
- Lesson 15 Introduction to Simulation Modeling
- Lesson 16 Simulation Models
- Lesson 17 Data Mining

Additional Material presented:
- Importing Data into Excel
- Analysis of Variance and Experimental Design
- Statistical Process Control
- Statistical Reporting

**Course Format:**
You are responsible for completing assignments, such as reading the textbook and watching videos, before you come to class so that you are prepared to spend class time using Excel to complete homework problems, group assignments, and a project for each unit. The homework assignments you are required to complete will provide you with an understanding of quantitative data analysis techniques, as well as the knowledge of how to complete the analysis using Microsoft Excel. In class, you will apply the data analysis techniques to examples from the business world, and then use the results of the Excel data analyses to make decisions based on real world scenarios. For example, in the unit projects, you will need to choose the best technique to use to analyze data, analyze the data, interpret the results in terms of the decision being made, and make the decision. If you do not complete the assignments before class, you will not understand the material well enough to effectively use Excel to solve problems from the textbook during class.