MTH168 BUSINESS STATISTICS

I. CATALOG DESCRIPTION

A. Prerequisite: COMPASS college algebra score of at least 46, ASSET college algebra score of at least 40, ACT math score of 22 or higher, or MTH134 with a grade of “C” or better.

B. 3 semester hours credit.

C. Business Statistics covers descriptive statistics, probability, probability distributions, sampling distributions, and hypothesis testing. A graphing calculator is required. (F,S)

II. EXPECTED LEARNING OUTCOMES / ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>Students will be able to understand various statistical terminology (e.g., parameter, statistic, etc.).</th>
<th>In-class exercises, quizzes, midterm exam and final exam on which students demonstrate their understanding of various statistical terminology.</th>
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<tr>
<td>Students will be able to classify data into one of the following four categories: nominal, ordinal, interval or ratio.</td>
<td>Midterm exam and final exam on which students demonstrate their ability to classify data into one of the four categories.</td>
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<td>Students will be able to summarize data using various statistical techniques (e.g., dot diagrams, stem-and-leaf displays, frequency distributions, percentage frequency distributions, histograms, etc.).</td>
<td>In-class exercises, quiz, midterm exam and final exam on which students demonstrate their ability to summarize data using various statistical techniques.</td>
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<td>Students will be able to compute various statistical measures for either a population or a sample (i.e., mean, median, mode, range, variance and standard deviation).</td>
<td>In-class exercises, quiz, midterm exam and final exam on which students demonstrate their ability to compute various statistical measures for either a population or a sample.</td>
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<td>Students will be able to apply rules associated with multiplication of choices, permutations and combinations in the calculation of the number of possible outcomes.</td>
<td>In-class exercises, quiz, midterm exam and final exam on which students demonstrate their ability to apply rules associated with multiplication of choices, permutations and combinations in the calculation of the number of possible outcomes.</td>
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<td>Students will be able to apply various rules associated with probability theory.</td>
<td>In-class exercises, quiz, midterm exam and final exam on which students demonstrate their ability to apply various rules associated with probability theory.</td>
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<td>Students will be able to use formulas for</td>
<td>In-class exercises, quiz, midterm exam and</td>
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<td>Students will be able to compute the mean, variance and standard deviation for any discrete probability distribution.</td>
<td>In-class exercises, quiz, midterm exam and final exam on which students demonstrate their ability to compute the mean, variance and standard deviation for any discrete probability distribution.</td>
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<td>Students will be able to use the standard normal distribution table to find probabilities associated with any normal distribution.</td>
<td>In-class exercises, quizzes, midterm exam and final exam on which students demonstrate their ability to use a standard normal distribution table to find probabilities associated with any normal distribution.</td>
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<td>Students will be able to use the $t$-distribution table to find probabilities associated with sampling distributions of the mean derived from small samples.</td>
<td>In-class exercises, quiz, and final exam on which students demonstrate their ability to use the $t$-distribution table to find probabilities associated with sampling distributions of the mean derived from small samples.</td>
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<td>Students will be able to make confidence statements about the maximum error when the sample mean is used to estimate the population mean.</td>
<td>In-class exercises, quiz and final exam on which students demonstrate their ability to make confidence statements about the maximum error when the sample mean is used to estimate the population mean.</td>
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<tr>
<td>Students will be able to construct large-sample and small-sample confidence intervals for the population mean.</td>
<td>In-class exercises, quiz and final exam on which students demonstrate their ability to construct large-sample and small-sample confidence intervals for the population mean.</td>
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<tr>
<td>Students will be able to perform various statistical tests (including small-sample and large-sample tests concerning means and differences between means, and large-sample tests concerning proportions and differences between proportions).</td>
<td>In-class exercises, quizzes and final exam on which students demonstrate their ability to perform various statistical tests.</td>
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<td>Students will be able to apply the method of least squares to the estimation of linear regression equations.</td>
<td>In-class exercises, quiz and final exam on which students demonstrate their ability to apply the method of least squares to the estimation of linear regression equations.</td>
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<td>Students will be able to compute and interpret correlation coefficients for sample data.</td>
<td>In-class exercises, quiz and final exam on which students demonstrate their ability to compute and interpret correlation coefficients for sample data.</td>
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**III. COURSE OUTLINE WITH UNIT OBJECTIVES**
A. Introduction (Chapter 1)
   1. Definition of the term, “Statistics”
   2. Distinction between Descriptive Statistics and Inferential Statistics
   3. Definition of the Concept, “Probability”
   4. Discussion of the Four Levels of Data Measurement: Nominal, Ordinal, Interval and Ratio

B. Summarizing Data (Chapters 2 and 3)
   1. Dot Diagrams and Stem-and-Leaf Displays
   2. Frequency Distributions
   3. Graphical Presentations
   4. Mean, Median and Mode
   5. Range, Variance and Standard Deviation
   6. Some Applications of the Standard Deviation (Optional)

C. Possibilities and Probability (Chapters 4 and 5)
   1. Multiplication of Choices
   2. Permutations
   3. Combinations
   4. Probability and Mathematical Expectation
   5. Sample Space and Events
   6. Some Basic Rules of Probability
   7. Addition Rules

D. Probability Distributions (Chapters 6 and 7)
   1. Binomial Distribution
   2. Hypergeometric Distribution
   3. Poisson Distribution
   4. Mean and Standard Deviation of a Probability Distribution
   5. Normal Distribution
   6. Normal Approximation to the Binomial Distribution

E. Sampling Distributions and Estimation (Chapters 8 and 9)
   1. Sampling Distributions
   2. Central Limit Theorem
   3. Estimation of Means
   4. Confidence Intervals for Means

F. Tests Concerning Means and Proportions (Chapters 10 and 11)
   1. Tests of Hypotheses
   2. Tests Concerning Means
   3. Tests Concerning Differences Between Means
   4. Tests Concerning Proportions
   5. Tests Concerning Differences Between Proportions
G. Regression and Correlation (Chapter 12)
   1. Method of Least Squares
   2. Regression Analysis
   3. Coefficient of Correlation

IV. METHOD OF INSTRUCTION

   A. Lecture
   B. Class Discussion, In-class Exercises
   C. Textbook

V. REQUIRED TEXTBOOK WITH PUBLICATION INFORMATION


VI. REQUIRED MATERIALS (STUDENT)

Graphics Calculator – TI-83 plus recommended

VII. SUPPLEMENTAL REFERENCES

Solution Manual

VIII. METHOD OF EVALUATION (BASIS FOR DETERMINING COURSE GRADE)

   A. Attendance
   B. Closed-Book, In-Class, Chapter Quizzes (for each chapter except Chapter 1)
   C. Closed-Book, In-Class, Midterm Exam (Chapters 1-7)
   D. Closed-Book, In-Class, Final Exam (Chapters 1-12)

IX. ADA STATEMENT

   Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-797-3000, ext. 169).

X. ACADEMIC HONESTY STATEMENT
All students are responsible for complying with campus policies as stated in the Student Handbook (see College Website).