JEFFERSON COLLEGE

COURSE SYLLABUS

MTH132

INTRODUCTORY STATISTICS

3 Credit Hours

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MTH132 Introductory Statistics

I. CATALOGUE DESCRIPTION

A. Course pre-requisites/co-requisites: Reading Proficiency. Must meet math requirement by one of the following: High School GPA 3.0+ within five years, ACT 22+ within two years, Accuplacer Elementary Algebra 107+ within two years, Accuplacer College Level Math 39+ within two years, JC Non-STEM College Math Placement Exam 50+ within two years, HiSET Career and College Readiness level or GED score 175+ within five years, high school GPA 3.0+ within seven years and MTH092 Support for Introductory Statistics, JC Non-STEM College Math Placement Exam 20-49 within two years and MTH092, Support for Introductory Statistics, GED Score 165-174 within seven years and MTH092 Support for Introductory Statistics

B. 3 semester credit hours

C. Introductory Statistics is an introduction to the use of basic tools and methods of probability and statistics. Students will use these tools to describe populations and find their place within them, explore the relationship between related phenomena and use it to make predictions, and determine the likelihood of particular outcomes in given situations. This course will meet the requirement for the Associate of Arts Degree. Students may not apply both MTH132 and MTH168 or both MTH132 and BUS168 toward graduation. (F)

D. Fulfills Mathematical Sciences CORE requirement for AA, AAT, AFA, and select AAS degrees; MOTR MATH 110 Statistical Reasoning equivalent.
Elective course applies toward AA and AAT degree requirement.

EXPECTED LEARNING OUTCOMES/CORRRESPONDING ASSESSMENT MEASURES

Note: Each of the following learning outcomes will be measured on at least one in-class exam, but instructors are encouraged to assess them with additional measures, including homework, quizzes, and/or projects.

Expected Learning Outcomes	Assessment Measures
Identify strengths and weaknesses of various data collection and display practices, and demonstrate good practices for quantitative and qualitative data (data types and graphs, and avoiding bias)	Homework Quizzes/Tests
Describe what is considered normal for a particular attribute of a population, such as mpg of compact cars, and how spread out members of the population are (Measures of center and spread)	Homework Quizzes/Tests
Calculate the likelihood of events, such as being in a car	Homework

accident given that you live in a city, in both discrete and continuous environments (Probability rules)	Quizzes/Tests
Determine the likelihood of an individual falling within a certain portion, such as the richest ten percent, of a normally distributed population (Normal distribution and z-tests)	Homework Quizzes/Tests
Make and interpret predictions of what is normal for a given attribute, such as IQ, and describe the strengths, and limitations of these predictions (Confidence intervals)	Homework Quizzes/Tests
Describe the relationship between related attributes, such as education level and income, and make predictions about the relationship (Correlation and regression)	Homework Quizzes/Tests

II. OUTLINE OF TOPICS

A. Types of Data
   1. Quantitative and Qualitative
   2. Continuous and Discrete
   3. Nominal, Ordinal, and Cardinal

B. Organizing and Presenting Data
   1. Dot Plots
   2. Stem and Leaf Plots
   3. Frequency and Relative Frequency Distributions
   4. Histograms
   5. Comparing back-to-back Population Distributions

C. Describing Data
   1. Measures of Center and Spread
   2. The Five Number Summary and Boxplots
   3. Percentiles, Z-scores, Outliers and Unexpected Outcomes
   4. Clusters, Gaps and Skewness
   5. Comparing back-to-back Population Distributions

D. Collecting Data
   1. Census, Survey, Observation, and Experiment
   2. Random Selection and Assignment
   3. Bias and Confounding Variables
   4. Practical and Statistical Significance
   5. Designing Appropriate Studies

E. Probability
   1. Probabilities of Simple Events
   2. Compound Events With and Without Replacement
   3. Conditional Probabilities and Contingency Tables
   4. Counting Methods

F. Discrete Probability Distributions
   1. Probability Distribution Functions
   2. Binomial and Geometric
   3. Hypergeometric and Poisson
   4. Determining the Appropriate Distribution
   5. Probability of Specific Outcomes and Ranges of Outcomes
   6. The Mean, Standard Deviation, and Unexpected Outcomes

G. Continuous Probability Distribution
   1. Uniform, Exponential, and Normal Distributions
   2. Determining the Appropriate Distribution
   3. Probability of Specific Outcomes and Ranges of Outcomes
   4. The Mean, Standard Deviation, and Unexpected Outcomes
   5. Z-Scores and Percentiles

H. Inferential Statistics
   1. The Central Limit Theorem
   2. Confidence Intervals for a Mean
   3. Confidence Intervals for a Proportion
   4. Determining Required Sample Size
   5. Two-Population Confidence Intervals for the Mean

I. Hypothesis Testing
   1. Null and Alternate Hypotheses
   2. One vs. Two tailed tests
   3. Test Hypotheses for Mean and Proportion
   4. Determining Required Sample Size
   5. Two Population Hypothesis Testing

J. Correlation and Regression
   1. Creating and Interpreting Scatterplots
   2. The Correlation Coefficient
   3. Linear Regression

IV. METHODS OF INSTRUCTION

A. Lecture and Discussion

B. In-Class Activities

V. REQUIRED TEXTBOOKS

A. Introductory Statistics, openstax.com

VI. REQUIRED MATERIALS

A. Texas Instruments TI-83 or TI-84 graphing calculator

VII. SUPPLEMENTAL RESOURCES

A. Academic Success Center

B. Peer Tutoring

VIII. METHODS OF EVALUATION

A.	Tests	60%
B.	Quizzes and Assignments	10%
C.	Homework	10%
D.	Final Exam	20%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169)

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, http://www.jeffco.edu).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.