



Syllabus

MAT 121 - Introductory Statistics I

General Information

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Department Mathematics

Course Prefix MAT

Course Number 121

Course Title Introductory Statistics I

Course Information

Catalog Description A first course in statistics designed to introduce descriptive statistics of one and two variables, and probability; and to assimilate those concepts into an understanding of probability distributions. Topics include measures of central tendency, variability, graphical displays, linear correlation, and regression, dependent and independent probability, discrete and continuous probability distributions. The course will emphasize computer or calculator use (graphing calculator, Minitab, Excel, StatCrunch, etc.) to obtain results.

Credit Hours 3

Lecture Contact Hours 3

Lab Contact Hours 0

Other Contact Hours 0

Grading Scheme Letter

Prerequisites

None

Co-requisites

None

First Year Experience/Capstone Designation

This course **DOES NOT** satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category

Mathematics (and Quantitative Reasoning)

FLCC Values

Institutional Learning Outcomes Addressed by the Course

Inquiry and Interconnectedness

Course Learning Outcomes

Course Learning Outcomes

1. Use the language of statistics to present, interpret, and critically analyze data.
2. Summarize univariate data visually through graphs and numerically through statistical measures.
3. Analyze bivariate data using linear correlation and regression.
4. Apply the concepts of probability and probability distributions to problem situations, with an emphasis on the binomial and normal distributions.

Outline of Topics Covered

Note: The following is a list of topics. The order in which the material is covered need not follow the ordering below.

1) Fundamental Terminology and Concepts

a) Population vs. Sample

b) Parameter vs. Statistic

c) Variable

d) Data – Quantitative vs. Qualitative; Discrete vs. Continuous; (Nominal vs. Ordinal - Optional)

e) Appropriate Use and Misuse of Statistics

2) Sampling

a) Methods

b) Simple Random Sample

c) Cluster

d) Stratified

- e) Systematic
- f) Convenience
- g) Sampling Bias
- 3) Organization of Data
 - a) Graphical
 - b) Quantitative Data : Histogram, Dot plot, Box plot, Stem-and-Leaf
 - c) Qualitative Data : Bar Chart, Pie Chart, Pareto
 - d) Tabular
 - e) Ungrouped vs. Grouped Frequency Distribution
 - f) Relative
 - g) Cumulative
- 4) Distribution of Quantitative Data
 - a) Shape
 - b) Skewed vs. Symmetrical
 - c) Bimodal
 - d) Uniform
 - e) Normal
 - f) (J-shaped – Optional)
 - g) Understanding The Relationship Between Graphs And Measures of Central Tendency, Position and Dispersion
- 5) Computing and Interpreting Measures of Central Tendency
 - a) Mean
 - b) Median
 - c) Mode
 - d) Midrange (Optional)
 - e) Mid-quartile (Optional)
- 6) Computing and Interpreting Measures of Position
 - a) Quartiles
 - b) Percentiles
 - c) Standard score (z-score)
 - d) Outliers
- 7) Computing and Interpreting Measures of Dispersion
 - a) Range
 - b) Deviation from the Mean
 - c) Mean Absolute Deviation (Optional)
 - d) Variance
 - e) Standard Deviation
 - f) Inter-Quartile Range
 - g) Chebyshev's Theorem
 - h) Empirical Rule
- 8) Probability
 - a) The Concept of Probability
 - b) Sample Space Representations : List, Table, Tree diagrams
 - c) Simple vs. Compound Events

- d) Types of Probability : Empirical, Theoretical, Subjective
- e) Compound events
- f) Mutually exclusive
- g) Independent/dependent events
- h) Introduction to General Addition And Multiplication Rules
- i) Introduction to Conditional probability
- 9) Probability Distributions of A Random Variable
 - a) Random Variable : Discrete vs. Continuous
 - b) The Concept of a Probability Distribution
 - c) Representations of a Probability Distribution
 - d) Computing and Interpreting Mean/Standard Deviation For Probability Distribution
 - e) Binomial Probability Distribution
 - f) Characteristics Of A Binomial Experiment
 - g) Computing Binomial Probabilities
 - h) Computing and Interpreting the Mean and Standard Deviation (Optional)
- 10) Normal Distribution
 - a) Characteristics of A Normal Distribution
 - b) Computing Normal Probabilities
 - c) Interpreting the Mean and Standard Deviation (Optional)
 - d) Normal Distribution Approximations of A Binomial Distribution (Optional)
- 11) Bivariate Data
 - a) Scatter plot
 - b) Types of Correlation
 - c) Linear (main focus)
 - d) Strength
 - e) Direction
 - f) Existence Of Non-Linear Correlations
 - g) Correlation Vs. Causation
 - h) Using Linear Regression To Make Predictions
 - i) Restrictions on Using Linear Regression.