

Statistics Content Learning Outcomes

Revised draft based on November 2015

Learning Outcome 1: Descriptive Statistics

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The student should be able to:

- compute measures of center and measures of variation of data.
- interpret measures of center and measures of variation of data.
- construct graphical displays to summarize data.
- analyze graphical displays to summarize data.

Learning Outcome 2: Probability

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The student should be able to:

- compute empirical and theoretical probabilities using the rules of probabilities and combinatorics.
- interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.
- utilize basic concepts of probability including independence and conditional probability to calculate event probabilities.
- utilize basic concepts of probability including independence and conditional probability to interpret event probabilities.
- utilize basic concepts of probability including independence and conditional probability to communicate event probabilities.

Learning Outcome 3: Discrete and continuous probability distributions

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The student should be able to:

- determine the appropriate probability distribution based on experiment conditions and assumptions (including the uniform, normal, and binomial distributions)

Learning Outcome 4: Correlation and Regression

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The student should be able to:

- calculate the correlation coefficient
- interpret the correlation coefficient
- communicate the correlation coefficient
- calculate the simple linear regression equation
- interpret the simple linear regression equation
- communicate the simple linear regression equation

Learning Outcome 5: Sampling distributions

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The student should be able to:

- calculate probabilities involving the sample mean using the Central Limit Theorem.
- interpret probabilities involving the sample mean using the Central Limit Theorem.
- communicate probabilities involving the sample mean using the Central Limit Theorem.

Learning Outcome 6: Inference

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The student should be able to:

- calculate confidence intervals.
- interpret confidence intervals.
- communicate confidence intervals.
- perform (the basic components of) hypothesis tests for one and/or two samples.
- interpret (the basic components of) hypothesis tests for one and/or two samples.
- communicate (the basic components of) hypothesis tests for one and/or two samples.

Learning Outcome 7: Data collection/experiment design

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The student should be able to:

- identify sampling techniques and experimental designs including sources of bias.
- evaluate common sampling techniques and experimental designs including sources of bias.