Statistics Content Learning Outcomes

Revised draft based on April 2013 content working group

Learning Outcome 1: Descriptive Statistics

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The student should be able to:

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

Learning Outcome 2: Probability

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The student should be able to:

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

Learning Outcome 4: Correlation and Regression

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The student should be able to:

- calculate, interpret and communicate the correlation coefficient and simple linear regression equation.

Learning Outcome 5: Sampling distributions

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The student should be able to:

- calculate, interpret and 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, interpret and communicate confidence intervals
- perform, interpret and 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 and evaluate common sampling techniques and experimental designs including sources of bias.