COURSE SYLLABUS

Descriptive Statistics for Data Analysis Course

Gain foundational statistical skills using measures such as averages, proportions, and variability to interpret data effectively.

> Group classes (Live Online) and onsite training are available for this course. For more information, email onsite@graduateschool.edu or visit: https://www.graduateschool.edu/courses/descriptive-statistics-for-data-analysis

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Course Outline

Module 1: Arithmetic and Algebra for Statistical Calculations

- Review order of operations and algebraic manipulation used in formulas.
- Convert among fractions, decimals, and percentages for analysis.
- Apply exponent rules and roots in statistical computations.
- Set up and solve equations that appear in descriptive statistics.

Module 2: Frequency Distributions for Categorical and Quantitative Data

- Organize data into tables and class intervals.
- Create and interpret histograms, bar charts, and frequency polygons.
- Distinguish between categorical and quantitative distributions.

Module 3: Descriptive Statistics for Categorical Data: Proportions and Percentages

- Compute proportions, percentages, and rates from frequency data.
- Compare categories using relative frequency and percent distributions.
- Present categorical summaries with clear labels and scales.

Module 4: Two and Three-Way Contingency Tables for Categorical Data

- Construct cross-tabulations to explore relationships between variables.
- Calculate joint, marginal, and conditional percentages.
- Identify patterns and potential associations across categories.

Module 5: Descriptive Statistics for Quantitative Data: Averages

- Compute mean, median, and mode and know when to use each.
- Handle grouped data and weighted means.
- Assess sensitivity of measures of center to skew and outliers.

Module 6: Descriptive Statistics for Quantitative Data: Dispersion

- Calculate range, interquartile range, variance, and standard deviation.
- Interpret dispersion to understand variability and consistency.
- Use boxplots and standard deviation rules to summarize spread.

Module 7: Calculating Relative Position with a Z Score

- Standardize values to z scores for comparison across scales.
- Interpret positive/negative z scores and percentiles.
- Apply z scores to identify unusual observations.

Module 8: The Standard Normal Distribution

- Describe properties of the normal curve and symmetry.
- Use standard normal tables to find areas and probabilities.
- Relate empirical rule (68–95–99.7) to real-world data.

Module 9: How to Select a Random Sample from a Population

- Differentiate populations, samples, and sampling frames.
- Implement simple random sampling and avoid selection bias.
- Use random digits or software to draw unbiased samples.