# 1530 Content Organization

Version from meeting W 8/9 am

## Unit 1 Descriptive Statistics

### 1.1 Statistical Literacy

#### 1.1A Understand basic concepts of statistics and statistical thinking (including statistical significance and unlikely events)

#### 1.1B Recognize types of data, including levels of measurement

#### 1.1C Recognize sampling methods and their strengths and weaknesses

#### 1.1D Recognize types of studies (observational, experimental, etc.)

#### 1.1E Recognize possible sources of bias or distortion in a study.

### 1.2 Summarizing and Graphing Data

#### 1.2A Construct a frequency distribution (general, relative, cumulative)

#### 1.2B Graph a frequency distribution as a histogram

#### 1.2C Construct a dotplot

#### 1.2D Construct a stem-and-leaf plot

### 1.3 Measures of Center

#### 1.3A Find mean of a dataset

#### 1.3B Find median of a dataset

#### 1.3C Find mode of a dataset

#### 1.3D Find midrange of a dataset

#### 1.3E Estimate the mean of a frequency distribution

### 1.4 Measures of Variation

#### 1.4A Find range of a dataset

#### 1.4B Find variance and standard deviation of a dataset

#### 1.4C Estimate the standard deviation of a frequency distribution

### 1.5 Measures of Relative Standing

#### 1.5A Find a specific percentile for a dataset

#### 1.5B Find five-number summary for a dataset

#### 1.5C Construct boxplot and modified boxplot (with outliers identified) for a dataset

## Unit 2 Discrete Probability Distributions

### 2.1 Fundamentals of Probability

#### 2.1A Understand properties of probabilities (0, 1, unusual, etc.)

#### 2.1B Solve basic probability problems

#### 2.1B Define and use the probability rules for complementary events

### 2.2 The Addition Rule

#### 2.2A Identify sets of disjoint events

#### 2.2B Apply the addition rule

#### 2.2C Apply the addition rule to a contingency table

### 2.3 Conditional Probability and the Multiplication Rule

#### 2.3A Apply the multiplication rule to a set of independent events

#### 2.3B Apply the multiplication rule to a set of dependent events

#### 2.3C Apply the multiplication rule to a contingency table

### 2.4 Random Variables and Discrete Probability Distributions

#### 2.4A Identify discrete probability distributions and their random variables

#### 2.4B Find probabilities using a discrete probability distribution

#### 2.4C Determine the mean, variance and standard deviation of a discrete probability distribution

### 2.5 Binomial Probability Distributions

#### 2.5A Identify binomial probability distributions and their random variables

#### 2.5B Find probabilities using a binomial probability distribution

#### 2.5C Find mean, variance and standard deviation of a binomial random variable

## Unit 3 Normal Probability Distributions & Estimation

### 3.1 Introduction to Continuous Distributions

#### 3.1A Identify continuous distributions and their random variables

#### 3.1B Find probabilities for a uniform distribution

### 3.2 Introduction to Normal Distributions

#### 3.2A Apply the Empirical Rule (68-95-99.7 Rule) to normal distributions

#### 3.2B Find and interpret z-scores for data values of a normal distribution

#### 3.2C Apply the Range Rule to identify unusual values for a normal distribution

### 3.3 Probabilities for Normal Distributions

#### 3.3A Use z-scores to find probabilities for nonstandard normal distributions

#### 3.3B Find the value of a normal random variable when given a corresponding probability (including percentiles)

### 3.4 The Central Limit Theorem

#### 3.4A Use the Central Limit Theorem to find probabilities for a sample mean

### 3.5 Confidence Intervals: Proportions

#### 3.5A Construct a confidence-interval estimate for a population proportion

#### 3.5B Find point-estimate and margin of error for a given confidence interval

#### 3.5C Calculate minimum sample size to collect for a future estimate of a proportion

### 3.6 Confidence Intervals: Means

#### 3.6A Construct a confidence-interval estimate for a population mean

#### 3.6B Calculate minimum sample size for a future estimate of a mean

## Unit 4 Hypothesis Testing & Inference

### 4.1 Hypothesis Tests: Introductions

#### 4.1A Identify basic purpose of each step in a P-value hypothesis test

#### 4.1B Translate text claim into null and alternate hypotheses

### 4.2 Hypothesis Tests: Proportions

#### 4.2A Calculate test statistic to test a claim about a proportion

#### 4.2B Use P-value to evaluate null hypothesis for the test

#### 4.2C Formulate conclusion about the original claim

#### 4.2D Explore use of confidence interval estimate to test a claim

### 4.3 Hypothesis Tests: Means

#### 4.3A Calculate test statistic to test a claim about a mean

#### 4.3B Use P-value to evaluate null hypothesis for the test

#### 4.3C Formulate conclusion about the original claim

### 4.4 Hypothesis Tests: Standard Deviations

#### 4.4A Calculate test statistic to test a claim about a proportion

#### 4.4B Use P-value to evaluate null hypothesis for the test

#### 4.4C Formulate conclusion about the original claim

### 4.5 Linear Correlation and Regression

#### 4.5A Construct a scatterplot for a dataset of ordered pairs of values

#### 4.5B Evaluate whether a significant linear correlation exists in a set of ordered pairs

#### 4.5C Find the linear regression equation for a set of ordered pairs

#### 4.5D Determine when to use the linear regression equation for prediction

### 4.6 Goodness of Fit

#### 4.6A Test the goodness of fit for a multinomial distribution with equal expected values (and formulate conclusion)

#### 4.6B Test the goodness of fit for a multinomial distribution with unequal expected values (and formulate conclusion)

### 4.7 Test for Independence

#### 4.7A Test a hypothesis about independence of variables in contingency tables (and formulate

#### conclusion)