

Glencoe/McGraw-Hill

Elementary Statistics: A Step By Step Approach, 5/e ©2004
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correlated to

South Carolina
Advanced Placement Course
Description for Statistics

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CORRELATED TO

**SOUTH CAROLINA
ADVANCED PLACEMENT COURSE DESCRIPTION FOR STATISTICS**

<p>I. Exploring Data: Observing patterns and departures from patterns</p> <p><i>Exploratory analysis of data makes use of graphical and numerical techniques to study patterns and departures from patterns. Emphasis should be placed on interpreting information from graphical and numerical displays and summaries.</i></p>	<p>A. Interpreting graphical displays of distributions of univariate data (dotplot, stemplot, histogram, cumulative frequency plot)</p>	1. Center and spread	47-59, 149-154
		2. Clusters and gaps	47-59
		3. Outliers and other unusual features	139-142, 154
		4. Shape	47-59, 108-112, 149-154
	<p>B. Summarizing distributions of univariate data</p>	1. Measuring Center: median, mean	97-112
		2. Measuring spread: range, interquartile range, standard deviation	114-129, 139-142
		3. Measuring position: quartiles, percentiles, standardized scores (z-scores)	130-142
		4. Using boxplots	149-154
		5. The effect of changing units on summary measures	p. 112 #38 p. 129 #46
	<p>C. Comparing distributions of univariate data (dotplots, back-to-back stemplots, parallel boxplots)</p>	1. Comparing center and spread: within group, between group variation	76-79, 149-154
		2. Comparing clusters and gaps	76-79, 149-154
		3. Comparing outliers and other unusual features	76-79, 149-154
		4. Comparing shapes	76-79, 149-154
	<p>D. Exploring bivariate data</p>	1. Analyzing patterns in scatterplots	495-499, 507-509
		2. Correlation and linearity	499-509
		3. Least-squares regression line	509-518
		4. Residual plots, outliers, and influential points	Not in book
		5. Transformations to achieve linearity: logarithmic and power transformations	p. 544 Critical Thinking Challenge
	<p>E. Exploring categorical data: frequency tables</p>	1. Marginal and joint frequencies for two-way tables	Not in book
		2. Conditional relative frequencies and association	Not in book

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<p>II. Planning a Study: Deciding what and how to measure.</p> <p><i>Data must be collected according to a well-developed plan if valid information on a conjecture is to be obtained. This plan includes clarifying the question and deciding upon a method of data collection and analysis.</i></p>	<p>A. Overview of methods of data collection</p>	1. Census	670-671 (?)
		2. Sample survey	10-13
		3. Experiment	13-16
		4. Observational study	13-16
	<p>B. Planning and conducting surveys</p>	1. Characteristics of a well-designed and well-conducted survey	686-688
		2. Populations, samples, and random selection	11-13
		3. Sources of bias in surveys	686-688
		4. Simple and random sampling	11-13, 671-676
		5. Stratified random sampling	12-13, 677-679
	<p>C. Planning and conducting experiments</p>	1. Characteristics of a well-designed and well-conducted experiment	14-16
		2. Treatments, control groups, experimental units, random assignments, and replication	14
		3. Sources of bias and confounding, including placebo effect and blinding	15
		4. Completely randomized design	Not in book
		5. Randomized block design, including matched pairs design	Not in book
	<p>D. Generalizability of results from observational studies, experimental studies, and surveys</p>		15-16

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<p>III. Anticipating Patterns: Producing models using probability theory and simulation</p> <p><i>Probability is the tool used for anticipating what the distribution of data should look like under a given model.</i></p>	<p>A. Probability as relative frequency</p>	1. "Law of large numbers" concept	178-179
		2. Addition rule, multiplication rule, conditional probability, and independence	183-189, 193-204
		3. Discrete random variables and their probability distributions, including binomial	241-249
		4. Simulation of probability distributions, including binomial and geometric	688-694
		5. Mean (expected value) and standard deviation of a random variable, and linear transformation of a random variable	231-239
	<p>B. Combining independent random variables</p>	1. Notion of independence versus dependence	195-204
		2. Mean and standard deviation for sums and differences of independent random variables	Not in book
	<p>C. The normal distribution</p>	1. Properties of the normal distribution	270-271
		2. Using tables of the normal distribution	271-284
		3. The normal distribution as a model for measurements	287-293, 296-298
	<p>D. Sampling distributions</p>	1. Sampling distribution of a sample proportion	346-349
		2. Sampling distribution of a sample mean	301-304
		3. Central limit theorem	301-311
		4. Sampling distribution of a difference between two independent sample proportions	477-482
		5. Sampling distribution of a difference between two independent sample means	433-441, 454-460
		6. Simulation of sampling distributions	Not in book

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<p>IV. Statistical Inference: Confirming models</p> <p><i>Statistical inference guides the selection of appropriate models.</i></p>	<p>A. Confidence intervals</p>	1. The meaning of a confidence interval	328-332
		2. Large sample confidence interval for a proportion	346-351
		3. Large sample confidence interval for a mean	328-337
		4. Large sample confidence interval for a difference between two proportions	480-482
		5. Large sample confidence interval for a difference between two means (unpaired and paired)	438, 441
	<p>B. Tests of significance</p>	1. Logic of significance testing, null and alternative hypotheses; p -values; one- and two-sided tests; concepts of Type I and Type II errors; concept of power	367-378, 383-387, 421-423
		2. Large sample test for a proportion	401-406
		3. Large sample test for a mean	378-389
		4. Large sample test for a difference between two proportions	477-482
		5. Large sample test for a difference between two means	433-441
		6. Chi-square test for goodness of fit, homogeneity of proportions, and independence (one- and two-way tables)	549-558, 561-572
	<p>C. Special case of normally distributed data</p>	1. t-distribution	340-344
		2. Single sample t procedures	340-344, 392-399
		3. Two sample (independent and matched pairs) t procedures	458-460, 471-472, 474
		4. Inference for the slope of least-squares regression line	Not in book

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