Intro Stats (Math 1040 in PDF supplied) Pg No. 65-69 Triola, Elementary Statistics, 14e ©2022 NASTA				
Standards	**Objectives**	**Breakouts**	**Pg No**	**Topic**
Standard I: Students will understand, use, and evaluate random processes underlying statistical analysis.	Objective 1: Use sample survey data collected through random samples to draw conclusions about populations.	a. Recognize sources of bias in surveys, and discuss how surveys may be intentionally biased to support certain agendas.	314	Chapter 7: Estimating Parameters and Determining Sample Sizes Internet Surveys
		b. Explain the importance of randomness in good survey design.	2, 26 426 490	Chapter 1: Introduction to Statistics 1-3 Collecting Sample Data Chapter 8: Hypothesis Testing Resampling: Using Technology for Hypothesis Testing Chapter 9: Inferences From Two Samples 9-5 Resampling: Using Technology for Inferences
		c. Pose a question, choose an appropriate method of random selection, conduct a survey, and summarize the results in graphical displays.	426	Chapter 8: Hypothesis Testing Resampling: Using Technology for Hypothesis Testing
		d. Distinguish between different survey designs such as SRS, cluster sampling, stratified sampling, and systematic sampling.	28	Chapter 1: Introduction to Statistics 1-3 Collecting Sample Data
	Objective 2: Describe and use the features of good experimental design, such as random assignment of treatments, controls, placebos, blinding, and blocking.	a. Distinguish between an observational study and an experiment, and be able to select which method is appropriate to collect desired information.	27-33	Chapter 1: Introduction to Statistics 1-3 Collecting Sample Data
		b. Recognize possible sources of bias in various experiments, and describe how the features of good experimental design will reduce bias.	27	Chapter 1: Introduction to Statistics 1-4 Ethics in Statistics
		c. Pose a question, conduct one or more simple experiments using appropriate features of experimental design for the data	42	Chapter 1: Introduction to Statistics

		that is being collected, and summarize the results in graphical displays.		Cooperative Group Activities Q. 7
		d. Explain the importance of experimental ethics, and debate historical violations of experimental ethics.	36	Chapter 1: Introduction to Statistics 1-4 Ethics in Statistics
	Objective 3: Discuss and interpret surveys, experiments, and observations using information from government data, current events, medical experiments, polls, and news media.	a. Consider the reasonableness of claims of data from various sources, using examples to illustrate the uses and misuses of statistics that appear in the media.	37 41	Chapter 1: Introduction to Statistics Review Exercises Q. 1, 2 From Data to Decision
		b. Distinguish between causality and correlation, and be able to recognize unwarranted conclusions.	73 506-507	Chapter 2: Exploring Data with Tables and Graphs 2-4 Scatterplots, Correlation, and Regression Chapter 10: Correlation and Regression Chapter Problem: Are Powerball Ticket Lines Longer When the Jackpot is Higher
		c. Recognize when data is misrepresented by graphical manipulation, such as modified axes or use of incorrect visual proportions.	44	Chapter 2: Exploring Data with Tables and Graphs 2-3 Graphs That Enlighten and Graphs That Deceive
		d. Discuss the role of government reports such as the consumer price index for making comparisons in data.	46	Chapter 2: Exploring Data with Tables and Graphs No Phones or bathtubs
		e. Calculate percent change and perform simple calculations for price changes over the years due to inflation.	38	Chapter 1: Introduction to Statistics Review Exercises Q. 8
Standard II: Students will	Objective 1: Interpret and display data by selecting	a. Distinguish between quantitative and categorical data.	14	Chapter 1: Introduction to Statistics Types of Data

summarize and interpret data.	appropriate graphical methods.	b. Use quantitative data to create dot plots, stem plots, histograms, box plots, and scatter plots and use them to make sense of the data.	81 82	Chapter 2: Exploring Data with Tables and Graphs Chapter Quick Quiz Q. 8 Review Exercises Q. 2, 3, 4
		c. Use categorical data to create circle graphs, bar graphs and frequency tables and use them to make sense of the data.	82	Chapter 2: Exploring Data with Tables and Graphs Review Exercises Q. 7
	Objective 2: Summarize data and be able to use technology such as calculators or computer software to assist in calculations.	a. Calculate measures of center, and estimate center from data presented in a variety of forms, such as charts, tables, and graphs.	88 90 - 92	Chapter 3: Describing, Exploring, and Comparing Data 3-1 Measures of Center Example 1, Your Turn, Example 2, Your Turn, Example 3, Your Turn, Example 4, Your Turn.
		b. Select and interpret appropriate measures of spread.	104	Chapter 3: Describing, Exploring, and Comparing Data 3-2 Measures of Variation
		c. Describe the distribution of data considering shape, skewness, modality, and outliers.	45 55 83	Chapter 2: Exploring Data with Tables and Graphs 2-1 Frequency Distributions for Organizing and Summarizing Data 2-2 Histograms Technology Project
	Objective 3: Use data summaries to interpret and compare data.	a. Describe and compare individual performances in terms of quartiles, percentiles and standard deviations.	104 121	Chapter 3: Describing, Exploring, and Comparing Data 3-2 Measures of Variation 3-3 Measures of Relative Standing and Boxplots

		b. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of outliers.	45 55 59	Chapter 2: Exploring Data with Tables and Graphs 2-1 Frequency Distributions for Organizing and Summarizing Data 2-1 Beyond the basics 2-2 Histograms 2-2 Basic Skills and Concepts
		c. Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets.	45 55	Chapter 2: Exploring Data with Tables and Graphs 2-1 Frequency Distributions for Organizing and Summarizing Data 2-2 Histograms
	Objective 4: Describe the characteristics of the normal distribution, and create an understanding of the standard deviation as a measure of spread.	a. Examine data sets that approximate the normal distribution, and recognize the characteristics of data that are normally distributed.	246 258	Chapter 6: Normal Probability Distributions 6-1 The Standard Normal Distribution 6-1 Basic Skills and Concepts
		b. Compare individual measurements using the mean and standard deviation to find standardized scores and identify unusual data points.	272 329 345	Chapter 6: Normal Probability Distributions 6-1 The Standard Normal Distribution 6-3 Sampling Distributions and Estimators Chapter 7: Estimating Parameters and Determining Sample Sizes 7-2 Estimating a Population Mean 7-3 Estimating a Population Standard Deviation or Variance

		c. Use the 68%–95%–99.7% rule to determine the probability of events.	112	Empirical (or 68-95-99.7) Rule for Data with a Bell-Shaped Distribution
		d. Use the 68%–95%–99.7% rule to create and explain confidence intervals.	313	Confidence Interval
Standard III: Students will make inferences and justify conclusions based on data.	Objective 1: Summarize, represent, and interpret bivariate data.	a. Create and use graphs of bivariate data to visually assess trends and recognize patterns.	73	Chapter 2: Exploring Data with Tables and Graphs 2-4 Scatterplots, Correlation, and Regression
		b. Calculate regression lines and correlation coefficients for linear data using technology such as calculators or computer software.	73 75 78 79 529	Chapter 2: Exploring Data with Tables and Graphs 2-4 Scatterplots, Correlation, and Regression PART 2 Linear Correlation Coefficient r PART 3 Regression Example 6 Chapter 10: Correlation and Regression PART 1 Basic Concepts of Regression
		c. Use regression equations to make appropriate predictions.	78 79 529 544	Chapter 2: Exploring Data with Tables and Graphs PART 3 Regression Example 6 Chapter 10: Correlation and Regression PART 1 Basic Concepts of Regression 10-3 Prediction Intervals and Variation

		d. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	529 530	Chapter 10: Correlation and Regression PART 1 Basic Concepts of Regression Finding the Equation of The Regression Line
		e. Make predictions based on patterns and trends of non-linear data, such as seasonal data, tidal tables, sunspots, and population changes.	564 565	Chapter 10: Correlation and Regression 10-5 Nonlinear Regression Example 1 Finding the Best Population Model
	Objective 2: Display and compare data to make predictions and formulate conclusions.	a. Describe the effect of outliers on predictions.	544 545	Chapter 10: Correlation and Regression 10-3 Prediction Intervals and Variation Example 1 Powerball Jackpots and Ticket Sales: Finding a Prediction Interval
		b. Recognize and discuss the pitfalls of extrapolation in predictions.	544	Chapter 10: Correlation and Regression 10-3 Prediction Intervals and Variation
		c. Compare actual data measurements with predicted values, and discuss the reasonableness of predictions.	552 561	Chapter 10: Correlation and Regression 10-4 Multiple Regression 10-4 Basic Skills and Concepts Q. 16
	Objective 3: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	a. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	374 390	Chapter 8: Hypothesis Testing 8-1 Basics of Hypothesis Testing 8-2 Testing a Claim About a Proportion

		b. Understand and interpret confidence intervals generated from data.	312	Chapter 7: Estimating Parameters and Determining Sample Sizes 7-1 Estimating a Population Proportion
		c. Use the results of hypothesis testing to interpret sample data and draw conclusions.	374 388 406 424 433	Chapter 8: Hypothesis Testing 8-1 Basics of Hypothesis Testing 8-1 Basic Skills and Concepts Example 1 Adult Sleep: *P* - Value Method with technology Q.17, 18 Chapter Quick Quiz
Standard IV: Students will understand and use probability rules.	Objective 1: Use the rules of probability to calculate independent and conditional probabilities in real contexts.	a. Distinguish between subjective, experimental, and theoretical probability.	146-147	Three Common Approaches to Finding the Probability of an Event
		b. Calculate probabilities using addition and multiplication rules, tree diagrams, and twoway tables using correct probability notation.	158 167	Chapter 4: Probability 4-2 Addition Rule and Multiplication Rule 4-2 Basic Skills and Concepts
		c. Calculate conditional probabilities of compound events using twoway tables and Venn diagrams.	171 173	Chapter 4: Probability 4-3 Complements, Conditional Probability, and Bayes' Theorem Example 2 Pre-Employment Drug Screening
		d. Use permutations and combinations to find probabilities.	180 181 182	Chapter 4: Probability 4-4 Counting 2. Factorial Rule Permutations and

				Combinations: Does Order Count?
	Objective 2: Adapt probability models to solve real-world problems.	a. Perform simulations to estimate probability outcomes using technology and objects such as coins, spinners, cards, and dice.	190 191 192 204 205	Chapter 4: Probability 4-5 Simulations For Hypotheses Tests Example 1 Test the Claim That the Mean Body Temperature is 98.6°F Example 2 Probability of Three Birthdays That Are the Same Chapter 5: Discrete Probability Distributions Table 5-1 NFL Games Decided in Overtime 5-1 Probability Distributions
		b. Identify and explain common misconceptions regarding probability, including long-run vs. short-run behavior.	NA	
		c. Discuss probability applications in decision making, using terms such as "odds" and "risk," including applications in insurance, medical treatments, and extreme sports.	144 153 205 211	Chapter 4: Probability 4-1 Basic Concepts of Probability Example 9 Actual Odds Versus Payoff Odds Chapter 5: Discrete Probability Distributions 5-1 Probability Distributions Example 5 Identifying Significant Results With Probabilities 5-1 Basic Skills and Concepts Q. 28

				5-1 Beyond the Basics Q. 32 5-2 Binomial Probability Distributions
	Objective 3: Use probability to make decisions and analyze outcomes.	a. Calculate expected values and use them to solve problems.	205 218	Chapter 5: Discrete Probability Distributions 5-1 Probability Distributions 5-2 Binomial Probability Distributions
		b. Develop a probability distribution for a random variable and find the expected value.	205 212 214	Chapter 5: Discrete Probability Distributions 5-1 Probability Distributions PART 2 Expected Value and Rationale for Formulas 5-1 Basic Skills and Concepts
		c. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	144 153 154 205 206	Chapter 4: Probability 4-1 Basic Concepts of Probability Example 9 Actual Odds Versus Payoff Odds 4-1 Basic Skills and Concepts Q. 1, 3 Chapter 5: Discrete Probability Distributions 5-1 Probability Distributions
		d. Use probabilities to make fair decisions.	205 211 212	Chapter 5: Discrete Probability Distributions 5-1 Probability Distributions Example 5 Identifying

				Significant Results With Probabilities Example 6 Be a Better Bettor