Intro Stats (Math 1040 in PDF supplied) Pg No. 65-69 Bock, Stats in Your World, 3e ©2020 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.	246-247	Non-Response Bias Response Bias
		b. Explain the importance of randomness in good survey design.	234-235	Idea 2: Randomize
		c. Pose a question, choose an appropriate method of random selection, conduct a survey, and summarize the results in graphical displays.	243-244	Step-by-step example: Sampling
		d. Distinguish between different survey designs such as SRS, cluster sampling, stratified sampling, and systematic sampling.	237-242	SRS Stratified Sampling Cluster Sampling Systematic Sampling
	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.	257-260	Observational Studies Experiment
		b. Recognize possible sources of bias in various experiments, and describe how the features of good experimental design will reduce bias.	271	Confounding
		c. Pose a question, conduct one or more simple experiments using appropriate features of experimental design for the data that is being collected, and summarize the results in graphical displays.	261 262	Control, Randomize, and Replicate Designing an Experiment
		d. Explain the importance of experimental ethics, and debate historical violations of experimental ethics.	273-274	But is it ethical?

	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.		NA
		b. Distinguish between causality and correlation, and be able to recognize unwarranted conclusions.	150-153	Correlation
		c. Recognize when data is misrepresented by graphical manipulation, such as modified axes or use of incorrect visual proportions.		NA
		d. Discuss the role of government reports such as the consumer price index for making comparisons in data.		NA
		e. Calculate percent change and perform simple calculations for price changes over the years due to inflation.		NA
Standard II: Students will summarize and interpret data.	Objective 1: Interpret and display data by selecting appropriate graphical methods.	a. Distinguish between quantitative and categorical data.	6to8	What and Why
		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.	50 51-53 59 146	Dotplots The shape of a distribution Boxplot Looking at scatterplots
		c. Use categorical data to create circle graphs, bar graphs and frequency tables and use them to make sense of the data.	18-22	Frequency Table Bar Chart Pie Chart
	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.	54	A Measure of Center: The Median

	b. Select and interpret appropriate measures of spread.	55-57	Spread: Home on the Range
	c. Describe the distribution of data considering shape, skewness, modality, and outliers.	51-54	The Shape of a Distribution
Objective 3: Use data summaries to interpret and compare data.	a. Describe and compare individual performances in terms of quartiles, percentiles and standard deviations.	56 67	Spread: The Interquartile Range What About Spread? The Standard Deviation
	b. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of outliers.	51	The Shape of a Distribution
	c. Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets.	NA	
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.	51-54	The Shape of a Distribution
	b. Compare individual measurements using the mean and standard deviation to find standardized scores and identify unusual data points.	67 64	What About Spread? The Standard Deviation Summarizing Symmetric Distributions: The Mean
	c. Use the 68%–95%–99.7% rule to determine the probability of events.	124-126 396 404	The 68-95-99.7 Rule Exercise Exercise
	d. Use the 68%–95%–99.7% rule to create and explain confidence intervals.	404-409 124	Confidence Interval of a Proportion Working with 68-95-99.7 rule

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.	151	Correlation
		b. Calculate regression lines and correlation coefficients for linear data using technology such as calculators or computer software.	198	On the Computer
		c. Use regression equations to make appropriate predictions.	174-202	Line Up!
		d. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	179-180	The Linear Model
		e. Make predictions based on patterns and trends of non-linear data, such as seasonal data, tidal tables, sunspots, and population changes.		NA
	Objective 2: Display and compare data to make predictions and formulate conclusions.	a. Describe the effect of outliers on predictions.	97, 104	Telling the Stories of Quantitative Data
		b. Recognize and discuss the pitfalls of extrapolation in predictions.	192	Beware of Extrapolation
		c. Compare actual data measurements with predicted values, and discuss the reasonableness of predictions.	177	Residuals
	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.	238, 239	Population and Parameters
		b. Understand and interpret confidence intervals generated from data.	405-411 466	A Confidence Interval A Confidence Interval for Mean
		c. Use the results of hypothesis testing to interpret sample data and draw conclusions.	430-436	Testin Hypotheses

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.	312 321	Theoretical Probability Don't Think Personal Probability is mathemtically valid-What Can Go Wrong
		b. Calculate probabilities using addition and multiplication rules, tree diagrams, and twoway tables using correct probability notation.	332- 333 355- 362	Formal Probability The General Multiplication Rule Tree Diagram Table vs Venn diagram
	Objective 1: Use the rules of probability to calculate independent and conditional probabilities in real contexts.	a. Distinguish between subjective, experimental, and theoretical probability.	312 321	Theoretical Probability Don't Think Personal Probability is mathemtically valid-What Can Go Wrong
		b. Calculate probabilities using addition and multiplication rules, tree diagrams, and twoway tables using correct probability notation.	332 333 357 360 355	Formal Probability The General Multiplication Rule Tree Diagram Table vs Venn diagram
		c. Calculate conditional probabilities of compound events using twoway tables and Venn diagrams.	355	Table vs Venn diagram
		d. Use permutations and combinations to find probabilities.	313- 322	How to count Combinations and Probability
	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.	333- 335	Checking for Independence using Simulation

	b. Identify and explain common misconceptions regarding probability, including long-run vs. short-run behavior.	320	What can go wrong!
	c. Discuss probability applications in decision making, using terms such as "odds" and "risk," including applications in insurance, medical treatments, and extreme sports.	354	Depending on Independence
Objective 3: Use probability to make decisions and analyze outcomes.	a. Calculate expected values and use them to solve problems.	372	Expected Value
	b. Develop a probability distribution for a random variable and find the expected value.	372-373	Example
	c. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	374	First Center, Now Spread
	d. Use probabilities to make fair decisions.	370-384	Probability Models