

SDC Pacing for Block Schedule

Suggested Time	Learning Objective Covered in Class	Learning Objective Covered Outside of Class	OER
Day 1	Getting Started Orientation - Getting to know you activity, review syllabus and course requirements		
TOPIC 1: Sampling and Data			
Day 2	Understand the investigative process of Statistics		1.1
	Differentiate between descriptive and inferential statistics		1.1
	Differentiate between a population and a sample		1.1
Day 3	Understand the differences between a designed experiment and an observational study		1.4
	Differentiate between the type of variables used in a designed experiment		1.4
	Understand different methods used in an experiment to isolate effects of the explanatory variable		1.4
Day 4	Define a simple random sample and learn different ways to construct a random sample (random number table, calculator, etc..)		1.2
Day 5	Understand the differences between stratified sampling, cluster sampling, systematic sampling, and convenience sampling		1.2
Day 6	Determine when samples of convenience are acceptable and how sampling bias and error can occur		1.2
Day 7	Identify and classify data as either qualitative or quantitative and classify quantitative data as either discrete or continuous data		1.2
Day 8	Differentiate between levels of measurement : nominal, ordinal, interval, and ratio		1.3
Day 9	Review		
Day 10	Test 1		
TOPIC 2: Descriptive Statistics			
Day 11	Create a frequency distribution and relative frequency distribution from qualitative data		1.2, 2.1
Day 12	Display and interpret qualitative data with graphs: bar charts, pie graphs, and Pareto charts		1.2, 2.1
Day 13	Create a frequency distribution from a list of quantitative data (including grouped frequencies)		1.3
	Calculate relative frequencies and cumulative frequencies using a frequency distribution table		1.3
Day 14	Analyze a frequency distribution table and determine the sample size, class width and class midpoints		2.2
	Construct and interpret histograms from a frequency distribution table		2.2

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	Interpret the shape of the distribution from a graph: normal/symmetric, skewed, or uniform		2.6
Day 15	Display and interpret other graphs using quantitative data including stem-and-leaf plots, time series graphs, and line graphs		2.1
Day 16	Distinguish between a parameter and a statistic		1.1, 2.5
	Calculate and differentiate between different measures of center: mean, median, and mode		2.5
Day 17	Calculate the mean of a frequency distribution: GPA and weighted grade		2.5
Day 18	Calculate and differentiate between different measures of spread: range, variance, and standard deviation.		2.7
	Determine if a data value is unusual based on standard deviations, $\mu \pm 2\sigma$		2.7
Day 19	Recognize, describe, and calculate the measures of locations of data: quartiles, five number summary, interquartile range, and percentiles		2.3
	Calculate the upper and lower fences to identify outliers		2.3
	Display and interpret box plots		2.4
Day 20	Review		
Day 21	Test 2		
TOPIC 3: Probability			
Day 22	Understand and use terminology and symbols of probability		3.1
	Understand the concept of randomness: flipping a coin, rolling a die, and drawing a card from a standard 52 card deck		3.1
	List the elements of events and the sample space from an experiment		3.1
Day 23	Differentiate between and calculate different types of probabilities: empirical and theoretical		3.1, 3.6
	Explain the Law of Large Numbers		3.1
Day 24	Calculate and interpret probabilities using the complement rule and the addition rule		3.1, 3.2, 3.3
	Differentiate between and calculate probabilities for mutually exclusive and not mutually exclusive events		3.2, 3.3
	Use Venn diagrams and lists to solve probability problems when appropriate		3.5
Day 25	Calculate and interpret probabilities using the multiplication rule		3.1, 3.2, 3.3
	Differentiate between and calculate probabilities for both independent and dependent events (with or without replacement)		3.2, 3.3
Day 26	Identify and calculate conditional probabilities		3.1, 3.2, 3.3

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Day 27	Review		
Day 28	Test 3		
TOPIC 4: Discrete Random Variables			
Day 29	Identify the random variable in a probability experiment		4.1
	Recognize and understand discrete probability distribution functions		4.1
	Create a probability distribution for the values of a discrete random variable		4.1
	Use a probability function to determine probabilities associated with a discrete random variable		4.1
Day 30	Calculate and interpret the mean (expected value), variance, and standard deviation for a discrete probability distribution		4.2
Day 31	Define the Binomial distribution and determine when a discrete probability distribution should be classified as a Binomial distribution		4.3
Day 32	Calculate probabilities of Binomial distributions		4.3
Day 33	Calculate and interpret the mean (expected value), variance, and standard deviation for binomial probability distributions		4.3
Day 34	Review		
Day 35	Review		
Day 36	Comprehensive Midterm (Test 4)		
TOPIC 5: Continuous Random Variables and the Normal Distribution			
Day 37	Recognize and understand continuous probability density functions		5-intro
	Use a probability density curve to describe a population, including a normal population		5-intro
	Calculate and interpret the area under a probability density curve		5.1, 5.2
Day 38	Understand the general properties of the normal distribution: 100% is the total area under the curve, exactly 50% is to the left and right of the mean, and it is perfectly symmetric about the mean		6-intro
	Calculate percentages and probabilities using the Empirical Rule		6.1
Day 39	Explain the Standard Normal Distribution		6.1
	Calculate and interpret a z-score, understanding the concept of "standardizing" data		6.1
	Show students how to use Z-Tables to find area (probabilities) under the standard normal curve		Appendix H
Day 40	Use technology to calculate the area under the curve for any normal distribution model: left, right, and between		6.2
Day 41	Use technology to calculate percentiles, quartiles, and other numerical values of X for a specified area under a normal curve		6.2

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Day 42	Review		
Day 43	Test 5		
TOPIC 6: Central Limit Theorem			
Day 44	Recognize the characteristics of the mean of sample means taken from different types of populations: normal and non-normal		7.1
	Describe how the means of samples calculated from a non-normal population might be distributed		7.1, 7.3
	Assess the impact of sample size on sampling variability		7.3, 7.5
	Calculate the mean and standard error of sample means taken from different types of populations: normal and non-normal		7.1
Day 45	Define the Central Limit Theorem and determine whether the Central Limit Theorem can be used for a given situation		7.1, 7.3
	Apply the Central Limit Theorem to normal and non-normal populations and compute probabilities of a sample mean		7.1, 7.3
Day 46	Review		
Day 47	Test 6		
TOPIC 7: Confidence Intervals			
Day 48	Understand Confidence Intervals and how they can be used to estimate population parameters		8-intro
	Recognize the difference between the sample mean, $\bar{x}$, and the population mean, μ , as well as the difference between the sample standard deviation, s , and standard error of the mean, $s/\sqrt{n}$		8-intro
	Find the point estimate and margin of error (error bound) when given a confidence interval for a population mean		8.1
Day 49	Calculate the point estimate and margin of error for a population mean using sample statistics		8.1, 8.2
	Find critical values for $z_{(\alpha/2)}$ and $t_{(\alpha/2)}$ given a value of α and degrees of freedom.		8.1, 8.2
Day 50	Calculate and interpret confidence intervals for estimating a population mean		8.1, 8.2
	Read and write confidence intervals for means using two different forms: point estimate plus/or minus margin of error (error bound) and interval notation.		8.1
Day 51	Predict if a confidence interval around the mean will become wider or narrower given larger or smaller sample sizes as well as higher or lower confidence levels		8.1
	Estimate the sample size necessary to estimate a population mean		8.1
	Find the point estimate and margin of error (error bound) when given a confidence interval for a population proportion		8.1

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Day 52	Calculate the point estimate and margin of error for a population proportion using sample statistics		8.3
	Find critical values for $z_{(\alpha/2)}$ given a value of α		8.3
Day 53	Calculate and interpret confidence intervals for estimating a population proportion		8.3
	Read and write confidence intervals for proportions using two different forms: point estimate plus/or minus margin of error (error bound) and interval notation		8.3
Day 54	Predict if a confidence interval around the proportion will become wider or narrower given larger or smaller sample sizes as well as higher or lower confidence levels		8.1
	Estimate the sample size necessary to estimate a population proportion		8.3
Day 55	Review		
Day 56	Test 7		
TOPIC 8: Hypothesis Testing			
Day 57	Determine the appropriate null and alternative hypotheses when presented with a problem		9.1
	Determine if a test is left-tailed, right-tailed, or two-tailed		9.5
Day 58	Determine whether to reject or fail to reject the null hypothesis using the p-value method		9.4
	Differentiate between Type I and Type II errors		9.2
	Draw conclusions and make inferences about claims based on hypotheses tests		9.4
Day 59	Understand and list the assumptions needed to conduct z-tests		9.3
	Calculate test statistics and p-values for hypotheses tests for single proportions		9.4
Day 60	Conduct hypotheses tests for a single proportion		9.4, 9.5
Day 61	Understand and list the assumptions needed to conduct t-tests		9.3
	Calculate test statistics and p-values for hypotheses tests for single means		9.4
Day 62	Conduct hypotheses tests for a single mean		9.4, 9.5
Day 63	Differentiate between independent group and matched pair sampling		10-intro
	Calculate test statistics and p-values for hypotheses tests for the difference between two means		10.1
Day 64	Test hypotheses regarding the difference of two independent means (assume the variances are not pooled)		10.1
Day 65	Review		

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Day 66	Test 8		
TOPIC 9: Regression Correlation			
Day 67	Differentiate between the independent (explanatory variable, x) and the dependent (response variable, y) in a bivariate data set		12.1
	Create a scatter plot and determine the type of relationship that exists between two variables: positive or negative correlation and weak or strong correlation		12.2
Day 68	Calculate and interpret the correlation coefficient using technology		12.3
	Use the p-value to determine if a line of best fit is statistically significant		12.3, 12.4
	Calculate the line of best fit and interpret the coefficient of determination		12.3
Day 69	For a given value of x, find the appropriate estimated value of y		12.3, 12.5
	Distinguish between interpolated and extrapolated values and explain why interpolated values are more reliable		12.5
	Use the line of best fit to make conclusions about the relationship between two variables, understanding correlation does not imply causation		12.5
Day 70	Calculate a residual using the line of best fit.		12.3
	Perform a residual analysis to check assumptions of regression		12.6
Day 71	Review		
Day 73	Test 9		
CHALLENGE EXAM PREPARATION			
Day 74	Review for Challenge Exam		
Day 75	Review for Challenge Exam		
Day 76	Review for Challenge Exam		
Day 77	Review for Challenge Exam		
Day 78	Review for Challenge Exam		
Day 79	Review for Challenge Exam		
Day 80	CHALLENGE EXAM		
Day 81			
Day 82			
Day 83			
Day 84			
Day 85			
Day 86			

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Day 87			
Day 88			
Day 89			
Day 90			