Textbook Chapter	Dates and Duration	Curriculum Focus	Activities / Investigations / AP Problems to use
Preliminaries Helping students understand expectations along with what to expect from this course	**8/20/2018 – 8/22/2018** 4 calendar days 2 single period + 1 double-period Autobiography will be assigned to get to know each student, including items that may be useful in developing projects	Introduction to Statistics What to expect from this course Introduction to the Six-Step Method Exploring Data – Preliminaries 2 – Shape, Outliers, Center, Spread Random Processes – Preliminaries 3	Smelling Parkinson's Disease Are left-handed quarterbacks going extinct? Use AP 2006 #1 and AP 2008 Form B #1 Monte Hall Problem
Chapter 1 How Strong is the Evidence?	**8/24/2018 – 9/11/2018** 12 calendar days 8 single periods + 2 double-period class sessions **Included in timing** 2 Quizzes 1 Investigation with Partner 1 Exam – will include SBI	Introduction to Chance Models Introduction to 3S strategy (get a statistic, simulate, find strength of evidence) How to measure strength of evidence (p-value guidelines) Using z-scores to measure strength of evidence (z-score guidelines) Factors impacting the strength of evidence (distance of our statistic from hypothesized parameter, sample size, 1 vs 2-tailed tests) Central Limit Theorem Sampling distributions for sample proportions – conditions that guarantee a near normal sampling distribution One Proportion Z-Test	Can dolphins communicate? Can dogs understand human cues? St. George mortality rate Facial profiling Kristen Gilbert – American serial killer / nurse Competitive advantages to uniform colors? Predicting elections from faces Which tire? – Class investigation Independent Investigation – Develop a question of interest, use six-step approach for answering this question – work with assigned partner – demonstrate understanding of both simulation-based and theoretical approach to inference
Chapter 2 Generalization: How Broadly do the Results Apply?	**9/12/2018 – 10/11/2018** 20 calendar days 10 single period + 5 double-period class sessions **Included in timing** 3 Quizzes 1 Investigation with Partner 1 Exam	Sampling Strategies – SRS, Cluster, Stratified Bias in surveys (response bias, non-response bias Random sampling error vs non-sampling (systematic) errors Describing & displaying quantitative data (histograms, box plots, stem and leaf plots, dot plots), mean vs median as measure of center 3S strategy & six-step approach applied to inference for means and medians Sampling distributions for sample means – conditions that guarantee a near normal sampling distribution Impact of sample size on shape & variability of sampling distribution One-sample t-test t-curves – reading a table for critical values one vs two-tailed tests Error Analysis (Type I, Type II, power)	Sampling words from Gettysburg Address Stratified sampling – TI-nspire ice cream sales Sampling stars in the sky AP 2008 Form B #2 – Bias in estimates AP 2010 Form B #2 – SRS & stratifying AP 2011 #2 – cluster & stratified sampling AP 2013 #2 – sampling strategies AP 2014 #4 – mean vs median, sampling plans Sampling Pennies – Sampling distribution for sample means How much sleep do teens need? Independent Investigation – Same partner as 1st investigation, work on similarities in approach – demonstrate understanding of both simulation-based and theoretical approach to inference

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Chapter 3 Estimation: How Large is the Effect?	**10/15/2018 – 11/1/2018** 14 calendar days 8 single period + 3 double-period class sessions **Included in timing** 2 Quizzes 1 Investigation with Partner 1 Exam – will include SBI	Estimation with confidence intervals Simulations using bootstrapping to estimate a single proportion – how much variability to expect? Conditions to use a normal model 68-95-99.7 Rule to lead into 2SD approach for a 95% confidence interval One Proportion z-intervals Simulations using bootstrapping to estimate a single mean – how much variability to expect? Conditions to use a near normal model Using a 2SD approach for a 95% confidence interval One Sample t-intervals What impacts the width of a confidence interval? Sample size, confidence level, sample proportion Estimating sample size needed to obtain a specified margin of error Cautions when conducting inference: bias, sampling method, response bias, voluntary response bias, random errors. Difference between statistically significant and practically significant Relating significance level to power of a test. How to increase power.	Exploring American Exceptionalism AP 2016 #5 – 1 proportion interval + conditions AP 2017 #2 – 1 proportion interval AP 2013 #1 – 1 sample t-interval AP 2011B #5 – CI for proportion, M.E. & sample size AP 2018 #6 – Type II Errors and Power Independent Investigation to estimate a mean or a proportion – both SBI & theoretical approaches Errors and Nitrate Levels – Investigating Power with a study of nitrate levels near farms Is most published research wrong? Video
Chapter 4 Causation: Can we say what caused the effect?	**11/2/2018 – 11/15/2018** 10 Calendar days 6 single period + 2 double-period class sessions **Included in timing** 2 quizzes 1 exam	Association and Confounding – emphasis on communication when identifying potential confounding variables in a study Observational studies versus Experiments Purpose of: Blinding, randomization, control groups, blocking Key elements: Control, random assignment, replication Random assignment to treatment Establishing cause-effect relationships Completely randomized design & sketching the outline Randomized block design & sketching the outline	AP 2016 #3 – observational study vs experiment, confounding, AP 2011B #2 – random assignment, experiment vs observational study, significance AP 1999 #3 – observational study vs experiment, confounding, establishing causation AP 2007B #3 – blocking & implementing random assignment AP 2004 #2 – blocking on age & gender, random assignment to treatments AP 2001 #4 – blocking and randomization AP 2002B #3 - blocking Class experiment

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Chapter 5 Comparing Two Proportions	**11/16/2018 – 12/7/2018** 13 Calendar days 9 single period + 2 double-period class sessions **Include in timing** 2 quizzes 1 Investigation with Partner 1 exam – will include SBI	Comparing proportions with segmented bar graphs Creating 2-way tables & finding conditional probabilities associated with a scenario Tactile methods (card shuffling) for simulations – relate to pooling Bootstrapping for confidence intervals – relate resampling to "no pooling" Comparing 2 Proportions SBI approach & theoretical approach Two Proportion Z-Intervals & Two Proportion Z-Tests Simpson's Paradox	AP 2015 #4 – 2 Proportion Z-Test AP 2012 #4 – 2 Proportion Z-Test AP 2009B #3 – Conditions + 2 Proportion Z- Test AP 2006B #2 – CI for difference in proportions Home field advantages in sports? Is Yawning Contagious? CTE in contact sports (brain trauma) Do baby simulators impact teen pregnancy? GMO Labels & Negative Perceptions Independent investigation to either estimate the difference between two proportions OR to answer a question regarding if there is a significant difference between two proportions How to develop a research question.
1st Semester Final Exam Review	**12/10/2018 – 12/17/2018** 6 Calendar days 4 single period + 1 double-period class sessions **Include in timing** Review packet Time to review all projects that were submitted this semester	All concepts covered during the semester Review time covering both SBI and theoretical approaches to inference Opportunity for review of expectations for communication that demonstrates sound statistical reasoning	
Chapter 6 Comparing Two Means	**1/7/2019 – 1/24/2019** 13 Calendar days 7 single period + 3 double-period class sessions **Included in timing** 2 quizzes 1 Investigation with Partner 1 exam – will include SBI	Comparing quantitative data with dot plots, box plots, stem & leaf plots & histograms - Verbal comparisons using comparison phrases along with shape, outliers, center, spread (and any unusual features) - 1.5*IQR outlier test / mean +/- 2 standard deviation approach to outliers Mean vs median as a measure of center – resistance IQR vs standard deviation as a measure of variability – resistance Interpreting cumulative frequency plots Tactile approach to hypotheses tests and also confidence intervals SBI to compare 2 means or estimate a difference in 2 means Conditions needed to use the theoretical approaches for comparing 2 means 2 Sample T-Test and 2 Sample T-Interval	How big is Milwaukee? Anchoring with Chicago vs Green Bay Do plants grow better with classical music vs. heavy metal music? Does it make sense to split the bill when going out to eat with friends? Do men with children live longer, on average, than men with no children? AP 2006B #1 – cumulative frequency plot AP 2015 #1 – comparing distributions AP 2016 #1 – describing distributions - resistance AP 2018 #4 – 2 sample t-test AP 2011 #4 – 2 sample t-test AP 2009 #4 – 2 sample t-interval

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Chapter 7 Paired Data: One Quantitative Variable	**1/25/2019 – 2/5/2019** 8 Calendar days 6 single period + 1 double-period class sessions **Included in timing** 1 exam	Matched Pairs Experimental Design Paired data vs. 2 independent groups Reduced variability with matched pairs data Simulation-based methods for hypothesis test and confidence interval Validity conditions for paired tests and intervals Theory-based paired t-test and paired t-interval	Filtering water in Cameroon exploration Is rounding 1st base wide better than narrow? Dutch auction vs 1st price sealed bid Memorizing with music (instrumental vs lyrics) AP 2007 #4 AP 2006B #4 AP 2005B #4 AP 2001 #5
Chapter 8 Comparing More Than Two Proportions	**2/6/2019 – 2/22/2019** 10 calendar days 4 single period + 3 double-period class sessions **Included in timing** 1 Class Investigation 1 Exam	Comparing Multiple Proportions graphically (review of segmented bar graphs) Mean Absolute Difference Simulation Based methods (card shuffling approach) Calculating expected counts Degrees of Freedom for two-way table tests Reading a Chi-Square table Using Chi-Square components to assist in analysis of two-way tables Test for Homogeneity / Test of Independence / Goodness of Fit Test Review of sampling strategies and experimental design	Conserving Hotel Towels Nearsightedness and Night Lights Are World Series teams evenly matched? Stanley Cup teams? NBA Finals teams? Class investigation using Chi Square methods AP 2017 #5 AP 2016 #2 AP 2011B #4 AP 2008 #5 - GOF
Chapter 10 Two Quantitative Variables Linear & Non-Linear Regressions	**2/25/2019 – 3/12/2019** 11 calendar days 7 single period + 2 double-period class sessions **Included in timing** 2 Quizzes 1 Exam	Constructing scatterplots Describing associations between two quantitative variables with strength, direction and form, as well as any unusual features/observations Correlation as a measure of the strength and direction of a linear relationship Influential observations Least Squares Regression, residuals, extrapolation, coefficient of determination Interpreting the slope and y-intercept in context Using residual plots to determine if a model is appropriate All points passing through x-bar, y-bar Understanding standard deviation of the residuals Simulation-Based Inference for a Linear Relationship (correlation and slope) with a tactile approach Theory-based approach to inference for slope of a line (both hypothesis test and confidence interval Interpreting computer output for least squares regression Transformations to achieve linearity (power, exponential + variety of others)	AP 2001 #6 AP 2003B #1 AP 2004B #1 AP 2005 #3 AP 2005B #5 AP 2006A #2 – standard error of slope/residuals AP 2010B #6 – Interpreting slope/residual & C.I. AP 2011 #5 AP 2014 #6 How much tape is left? An investigation applying transformations to a non-linear data set.

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Chapter 11 Modeling Randomness	**3/13/2019 – 4/12/2019** 16 calendar days 10 single period + 3 double-period class sessions This includes Spring Break and a day to review when students return from break **Included in timing** 1 Quiz 1 Test 1 review day after returning from Spring Break	Sample spaces – multiple ways to organize Discrete probability distributions Probability Rules Venn Diagrams, Tree Diagrams, Two Way Tables Conditional Probabilities from Table & Formula Mutually Exclusive Addition Rule, Multiplication Rule, Complement Rule Conditional Probabilities and Independence Discrete Random Variables – Rules for Means and Variances Random Variable Rules Binomial & Geometric Random Variables - Calculating probabilities with formula and technology Normal Probability Calculations - Use of table as well as calculator - Empirical rule Revisiting Sampling Distributions (shape, center, spread) with simulation-based methods Revisiting Sampling Distributions (shape, center, spread) with theory-based methods	**Discrete Probability Distributions** AP 2004 #3 – binomials AP 2005B #2 – Mean & SD of discrete distribution + rules AP 2007B #2 – random variable, binomial, sampling distribution of sample mean AP 2010 #4 – expected value & SD of discrete distribution, binomial and normal calculations AP 2010B #2 – Recognizing binomial situation, calculating binomial probability, expected value AP 2011B #3 – Bernoulli calculations, normal, geometric AP 2012 #2 – expected value, normal approximation to binomial AP 2015 #3 rules for random variables, conditional probability, expected value **Normal Calculations** AP 1999 #4 AP 2002 #3 (along with rules for means & variances) AP 2003 #3 – along with binomial AP 2004B #3 – along with sampling distributions AP 2006A #3 AP 2006 #3 AP 2009 #2 – along with sampling distribution **General Probability** AP 2003B #2 Conditional probability+independence AP2009B – Conditional probabilities AP2010B #5 – Probability from table, conditional probability, independence of events AP 2011 AP 2017 #3 normal curve, tree diagrams, conditional probability
AP Exam Review	**4/13/2019 – 5/15/2019** 20 calendar days 12 single period + 4 double-period class sessions Minimal assessments other than to give feedback on how students are communicating with their write-ups	All concepts reviewed but with focus on clear communication that will meet the expectations of the readers of their exams.	