




Duluth High School

HIGH SCHOOL COURSE SYLLABUS



COURSE TITLE.....AP Statistics
TEACHERMr. David Curlette

TERM.....Fall 2013 & Spring 2014
ROOM #.....505

Email Address Teacher Web Page	Email: David_Curlette@gwinnett.k12.ga.us Website: www.CurletteMath.com	
Teacher Support (Help sessions etc.)	<ul style="list-style-type: none"> • Morning at 6:45am • Tuesdays and Thursdays after school until 3:00 pm. • See teacher for lunch time tutoring 	

COURSE DESCRIPTION (<http://apcentral.collegeboard.com/apc/public/repository/ap-statistics-course-description.pdf>)

The purpose of the AP course in statistics is to introduce students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Students are exposed to four broad conceptual themes:

1. Exploring Data: Describing patterns and departures from patterns
2. Sampling and Experimentation: Planning and conducting a study
3. Anticipating Patterns: Exploring random phenomena using probability and simulation
4. Statistical Inference: Estimating population parameters and testing hypotheses

INSTRUCTIONAL MATERIALS AND SUPPLIES

Published Materials	Instructional Supplies
Textbook: Bock, Velleman, De Veaux Stats Modeling the World. 3rd ed. Boston: Addison-Wesley, 2010. Cost:	<ol style="list-style-type: none"> 1. Pencils, pens, & colored pencils 2. 3 Ring Binder or Spiral Notebook, Paper, & Graph Paper 3. Calculator is encouraged but not required (TI-84 or NSPIR)

EVALUATION AND GRADING

Assignments	Grade Weights	Grading Scale
Classwork & Homework	Classwork & Homework 5 %	A: 90 and above
Chapter Tests	Quizzes 30 %	B: 80 – 89
Quizzes (scheduled and unannounced)	Chapter Tests 40 %	C: 74 – 79
Midterm	Midterm 5 %	D: 70 – 73
Performance Final	Performance Final 5 %	F: 69 or below
Final Exam	Final Exam 15 %	

OTHER INFORMATION

Expectations for Academic Success	Additional Resources/Requirements
<ol style="list-style-type: none"> 1) Encourage your classmates 2) Do Homework & Classwork daily 3) Ask questions 4) Come to class prepared 5) Complete any reviews for tests/quizzes 6) Redo problems missed to better yourself 7) Challenge yourself to continuously improve 	The best way to achieve the grade you desire in this class is to keep up with the daily work. Daily practice with AP Statistics is just like practicing any skill or sport; if you continue practicing, you get better. And when you need some extra help ask questions and get help during your lunch time from me, another teacher, or a friend. I want to you be successful in this course and in all math classes later in life. I believe in you! You Are Good At MATH!!!

COURSE CURRICULUM CONTENT

Primary Textbook References and Resource Materials

(Noted with the following letters in the Course Outline)

- T Bock, Velleman, De Veaux *Stats Modeling the World*. 3rd ed. Boston: Addison-Wesley, 2010.
- W Worksheets for reinforcement, introduction of concepts, or review.
- HW Homework problems assigned from the Bock, Velleman, De Veaux *Stats Modeling the World*. 3rd ed. textbook. Some of the problems listed are worked in class as discussion problems.

AP Statistics Course Outline (TENTATIVE)

nit 1 – Exploring and Understanding Data (25 Days)

Number of Days	Chapter/Topic/Activity/HW	Text Resources and Materials
0 days	<u>Chapter 1 – Stats Starts Here</u> Topics covered: <ul style="list-style-type: none"> What is statistics? HW: <ul style="list-style-type: none"> <input type="checkbox"/> Read Ch. 1 pgs. 2-6 	T pages 2 – 6
1 day	<u>Chapter 2 – Data</u> Topics covered: <ul style="list-style-type: none"> Analyzing Data – Who, What, When, Where, Why, How Categorical vs. Quantitative Variables TI: Entering data and working with data lists HW: <ul style="list-style-type: none"> <input type="checkbox"/> pgs. 16 – 18 #s 2, 4, 8, 10, 14, 16, 26 	T pages 7 – 19
4 days	<u>Chapter 3 – Displaying and Describing Categorical Data</u> Topics covered: <ul style="list-style-type: none"> Frequency and Relative Frequency Tables Distributions of Categorical Variables Importance of the Area Principle Bar and Pie Charts Contingency Tables Marginal and Conditional Distributions Independence of Categorical Variables Segmented Bar Charts Simpson’s Paradox HW: <ul style="list-style-type: none"> <input type="checkbox"/> Day 1: pgs. 38 – 39 #s 6, 8 – 10, 12 – 16 even <input type="checkbox"/> Day 2: pgs. 39 – 40 #s 18 – 24 even <input type="checkbox"/> Day 3: pg. 41 #s 26 – 30 even <input type="checkbox"/> Day 4: pgs. 42 – 43 #s 32 – 38 even 	T pages 20 – 43
1 day	Quiz Chapters 2 & 3	
6 days	<u>Chapter 4 – Displaying and Summarizing Quantitative Data</u> Topics covered: <ul style="list-style-type: none"> Distributions of Quantitative Variables Frequency and Relative Frequency Histograms Stem-and-Leaf Displays Dotplots Describing a Distribution in terms of shape, outliers, center, and spread Shape: Modality, Uniformity, Symmetry, Skewness, Unusual Observations, Gaps, and Clusters Comparing Distributions Measures of Central Tendency (Mean, Median, Mode, and Midrange) Measures of Spread (Range, IQR, Variance, Standard Deviation) Five Number Summary Quartiles/Percentiles TI: Creating a Histogram 	T pages 44 – 79

	<p>HW:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Day 1: W displaying data Part I <input type="checkbox"/> Day 2: W describing data Part II <input type="checkbox"/> Day 3: pgs. 72 – 73 #s 6 – 14 even <input type="checkbox"/> Day 4: pgs. 73 – 75 #s 16 – 28 even <input type="checkbox"/> Day 5: pgs. 75 – 76 #s 30 – 42 even <input type="checkbox"/> Day 6: pgs. 77 – 78 #48 	
1 day	<u>Quiz Chapter 4</u>	
4 days	<p><u>Chapter 5 – Understanding and Comparing Distributions</u></p> <p>Topics covered:</p> <ul style="list-style-type: none"> • Calculating Outlier “Fences” • Boxplots • Comparing Multiple Datasets • Resistance vs. Non-resistance to Extreme Values • Cumulative Frequency Graphs • TI: Creating a Boxplot, Finding the Five Number Summary, Calculating the Mean and Standard Deviation • Timeplots <p>HW:</p> <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: W Constructing a boxplot <input type="checkbox"/> DAY 2: pgs. 95 – 96 #s 6 – 12 even <input type="checkbox"/> DAY 3: pgs. 97 – 100 #s 14, 16, 20, 24, 28 <input type="checkbox"/> DAY 4: pg. 101 #s 34, 36 	T pages 80 – 103
1 day	<u>Quiz Chapter 5</u>	
4 days	<p><u>Chapter 6 – The Standard Deviation as a Ruler and the Normal Model</u></p> <p>Topics covered:</p> <ul style="list-style-type: none"> • Introduction to Standardized Scores (z-scores) • Shifting Data by Adding or Subtracting a Constant Value • Rescaling Data by Multiplying or Dividing by a Constant Value • Normal Models • Parameters vs. Statistics • Standard Normal Model • Empirical Rule (68-95-99.7 Rule) • Tables of Normal percentiles to calculate probabilities for a Normal Model and to find z-scores for a given percentile. • Assessing Normality • Normal Probability Plots • TI: Finding Normal Probabilities, Finding z-scores for a given percentile, Creating a Normal Probability Plot <p>HW:</p> <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pgs. 129 – 130 #s 2 – 22 even <input type="checkbox"/> DAY 2: pgs. 129 – 130 #s 2 – 22 even <input type="checkbox"/> DAY 3: pg. 131 #s 26 – 30 even <input type="checkbox"/> DAY 4: pgs. 132 – 133 #s 38 – 42 even 	T pages 104 – 143
1 day	<u>Quiz Chapter 6</u>	
1 days	Unit 1 Review	
1 day	<u>Unit 1 Test</u>	

Unit 2A – Exploring Relationships Between Variables (11 days)

Number of Days	Chapter/Topic/Activity/HW	Text Resources and Materials
3 days	<u>Chapter 7 – Scatterplots, Association, and Correlation</u> Topics covered: <ul style="list-style-type: none"> • Introduction to Bivariate Data • Creating a Scatterplot • Describing a Scatterplot in terms of Direction, Form, Strength, and Unusual Observations • Explanatory vs. Response Variables • Calculating Correlation • Conditions Required for Correlation • Properties for Correlation • Correlation Tables • Correlation vs. Association • Lurking Variables and Causation • TI: Creating a Scatterplot, Calculating Correlation HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pgs. 164 – 165 #s 2 – 10 even <input type="checkbox"/> DAY 2: pgs. 165 – 167 #s 12 – 26 even <input type="checkbox"/> DAY 3 pg. 168 #s 32 & 34 <input type="checkbox"/> DAY 4: pg. 169 #36 	T pages 146 – 170
1 day	<u>Quiz Chapter 7</u>	
4 days	<u>Chapter 8 – Linear Regression</u> Topics covered: <ul style="list-style-type: none"> • Linear Models • Predicted Values • Line of Best Fit • Regression to the Mean • Least Squares Regression Line (LSRL) • Finding the Slope and Y-intercept of the LSRL using Summary Statistics • Interpreting the Slope and Y-Intercept of the LSRL • Calculating and Interpreting Residual Values • Creating and Interpreting a Residual Plot • Understanding and Interpreting the Coefficient of Determination • Assumptions and Conditions for the Linear Regression Model • Reading Computer Output for Regression • TI: Finding the LSRL, Adding a Line to a Graph of Datapoints, Creating a Residual Plot HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pgs. 192 – 193 #s 2 – 10 even <input type="checkbox"/> DAY 2: pg. 193 #s 12 – 22 even <input type="checkbox"/> DAY 3: pgs. 194 – 195 #s 24 – 32 even <input type="checkbox"/> DAY 4: pgs. 195 – 196 #s 34 & 36 	T pages 171 – 200
1 day	<u>Quiz Chapter 8</u>	
1 days	<u>Unit 2A Review</u>	
1 day	<u>Unit 2A Test</u>	

Unit 2B – Exploring Relationships Between Variables (11 Days)

Number of Days	Chapter/Topic/Activity/HW	Text Resources and Materials
4 days	<u>Chapter 9 – Regression Wisdom</u> Topics covered: <ul style="list-style-type: none"> Exploring Subsets of Data Non-linear datasets Dangers of Extrapolation Examining Outliers in Regression Models Lurking Variables and Causation Working with Summary Values HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pgs. 214 – 215 #s 2 – 8 even <input type="checkbox"/> DAY 2: pg. 216 #s 12 – 16 even <input type="checkbox"/> DAY 3: pgs. 217 – 218 #s 20 & 22 <input type="checkbox"/> DAY 4: pgs. 218 – 219 #s 24 & 26; pg. 208 Just Checking 	T pages 201 – 221
1 day	<u>Quiz Chapter 9</u>	
4 days	<u>Chapter 10 – Re-expressing Data: Get It Straight!</u> Topics covered: <ul style="list-style-type: none"> Linear vs. Non-linear growth Re-expressing data sets Using the Ladder of Powers Using logarithms to straighten scatterplots, including the Exponential, Logarithmic, and Power models. TI: Using logarithms to re-express data, Creating residual plots HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pg. 239 #s 2 & 4 <input type="checkbox"/> DAY 2: pgs. 239 – 241 #s 6 – 12 even <input type="checkbox"/> DAY 3: pg. 241 #14 <input type="checkbox"/> DAY 4 pg. 242 #s 18 & 20 	T pages 222 – 252
1 day	<u>Quiz Chapter 10</u>	
1 day	Unit 2B Review	
1 day	Unit 2B Test	

Unit 3 – Gathering Data (14 Days)

Number of Days	Chapter/Topic/Activity/HW	Text Resources and Materials
2 days	<u>Chapter 11 – Understanding Randomness</u> Topics covered: <ul style="list-style-type: none"> Understanding the Concept of Randomness How the Mind is Not Random Tables of Random Digits Conducting a Simulation Components of a Simulation (outcomes, trials, response variables) TI: Seeding the Random Number Generator, Generating Random Numbers 	T pages 255 – 267

	<p>HW:</p> <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pg. 265 #s 2 – 10 even <input type="checkbox"/> DAY 2: pg. 265 #s 12 – 16 even 	
4 days	<p><u>Chapter 12 – Sample Surveys</u></p> <p>Topics covered:</p> <ul style="list-style-type: none"> • Sample Statistics vs. Population Parameters • The Good and the Bad of Polling • Why Randomization is Important in Sampling • How Sample Size Plays a Role in Sampling • Taking a Census • Sampling Frame • Sampling Variability • Statistical Sampling Methods: Simple Random Sampling, Stratified Random Sampling, Cluster Sampling, Multistage Sampling, Systematic Sampling • Nonstatistical Sampling Methods – Voluntary Response Sampling, Convenience Sampling • Bias in Sampling – Voluntary Response Bias, Sampling from a Bad Sampling Frame, Undercoverage, Overcoverage, Nonresponse Bias, Response Bias, Poorly Worded Questions <p>HW:</p> <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pg. 288 #s 2 – 10 even <input type="checkbox"/> DAY 2: pg. 289 #s 12 – 20 all <input type="checkbox"/> DAY 3: pg. 290 #s 22 – 30 even <input type="checkbox"/> DAY 4: pgs. 290 – 291 #s 32 – 36 even 	T pages 268 – 291
1 day	<u>Quiz Chapters 11 & 12</u>	
4 days	<p><u>Chapter 13 – Experiments and Observational Studies</u></p> <p>Topics covered:</p> <ul style="list-style-type: none"> • Observational Studies vs. Experiments • Types of Observational Studies – Retrospective vs. Prospective • Elements of an Experiment • Experimental Units, Subjects, and Participants • Explanatory Variables, Factors, Levels, and Treatments • Response Variables • Principles of Experimental Design (Control, Randomization, Replication, and Blocking) • Completely Randomized Experimental Designs • Idea of Statistical Significance • Control Treatments and Control Groups • Blinding (Single and Double Blind) • Placebo and Placebo Effect • Randomized Block Experimental Designs • Matched Pairs Designs • Idea of Confounded Variables 	T pages 292 – 322

	HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: 312 – 313 #s 2 – 10 even <input type="checkbox"/> DAY 2: 313 #s 14 – 18 even <input type="checkbox"/> DAY 3: pg. 313 – 314 #s 20 – 26 even <input type="checkbox"/> DAY 4: pg. 315 #s 36 – 40 even 	
1 day	Quiz Chapter 13	
1 day	Unit 3 Review	
1 day	Unit 3 Test	

Unit 4A – Randomness and Probability (10 days)

Number of Days	Chapter/Topic/Activity/HW	Text Resources and Materials
4 days	<u>Chapter 14 – From Randomness to Probability</u> Topics covered: <ul style="list-style-type: none"> • Difference between randomness and chaos • Probability as a Long Run Relative Frequency • Language of Probability – Trials, Outcomes, and Events, Sample Space • Fundamental Counting Rule • General Idea of Independence • Law of Large Numbers • Basic Rules of Probability • Complement Rule • Addition Rule for Disjoint Events • Multiplication Rule for Independent Events • Union and Intersection of Two Events • Introduction to Venn Diagrams HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pg. 338 #s 2 – 10 even <input type="checkbox"/> DAY 2: pg. 338 – 339 #s 12 – 20 <input type="checkbox"/> DAY 3: pgs. 339 – 340 #s, 22, 26 – 30 even <input type="checkbox"/> DAY 4: pgs. 340 – 341 #s 32 – 36 even 	T pages 324 – 341
4 days	<u>Chapter 15 – Probability Rules!</u> Topics covered: <ul style="list-style-type: none"> • Probability for Equally Likely Events • General Addition Rule • Conditional Probability • General Multiplication Rule • Formal Idea of Independence • Independent Events vs. Disjoint Events (Revisited) • Drawing with and without Replacement • Making a Picture – Venn Diagrams, Probability Tables, and Tree Diagrams • Introduction to Bayes’ Rule HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pgs. 361 – 362 #s 2 – 6 even <input type="checkbox"/> DAY 2: pg. 362 #s 8 – 12 even <input type="checkbox"/> DAY 3: pgs. 362 – 363 #s 16 – 20 even <input type="checkbox"/> DAY 4: pgs. 363 – 364 #s 22, 24, 34, 38 	T pages 342 – 366
1 days	Unit 4A Review	
1 days	Unit 4A Test	

Unit 4B –Randomness and Probability (13 days)

Number of Days	Chapter/Topic/Activity/HW	Text Resources and Materials
5 days	<u>Chapter 16 – Random Variables</u> Topics covered: <ul style="list-style-type: none"> • Random Variables • Discrete and Continuous Random Variables • Creating a Probability Model for Discrete Variables • Expected Values of Random Variables • Variance and Standard Deviation of Random Variables • Linear Transformations of Random Variables • Combining Independent Random Variables • Combining Normal Random Variables • TI: Calculating Mean and Standard Deviation for Probability Models HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pg 383 #s 2 – 8 even <input type="checkbox"/> DAY 2: pgs. 383 – 384 #s 10 – 18 even <input type="checkbox"/> DAY 3: pg. 384 #s 20 24 even <input type="checkbox"/> DAY 4: pgs. 384 – 385 #s 26 – 30 even <input type="checkbox"/> DAY 5: pg. 385 #s 38, 40 	T pages 366 – 387
6 days	<u>Chapter 17 – Probability Models</u> Topics covered: <ul style="list-style-type: none"> • Properties of Bernoulli Trials • Properties of the Geometric Model • Calculating Geometric Probabilities • Calculating the Expected Value and Standard Deviation for a Geometric Model • Properties of the Binomial Model • Calculating Binomial Probabilities • Calculating the Expected Value and Standard Deviation for a Binomial Model • Simulating Binomial and Geometric Probability Models • Normal Approximation to the Binomial Model • TI: Calculating Geometric Probabilities, Calculating Binomial Probabilities HW: <ul style="list-style-type: none"> <input type="checkbox"/> DAY 1: pg. 401 #s 2 – 8 even <input type="checkbox"/> DAY 2: pg. 402 #s 10 – 18 even <input type="checkbox"/> DAY 3: pgs. 402 – 403 #s 20 – 26 even <input type="checkbox"/> DAY 4: pg. 403 #s 32, 34 <input type="checkbox"/> DAY 5: pg. 403 # 36 <input type="checkbox"/> DAY 6: pg. 399 Just Checking 	T pages 388 – 410
1 days	Unit 4B Review	
1 days	Unit 4B Test	

END OF SEMESTER 1: 84 DAYS

The syllabus may be updated as needed throughout the year at the teacher's discretion.