AP STATISTICS

COURSE DESCRIPTION

AP Statistics is designed to introduce students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Students who successfully complete the course and AP examination may receive credit, advanced placement, or both for a one-semester introductory college statistics course.

GENERAL COURSE GOALS

- Explore, organize and describe data using graphs and numerical summaries
- Explore methods for producing data that can give clear answers to specific questions
- Use probability to describe chance, variation and risk to separate reality from background noise
- Draw conclusions about a wider universe while realizing that variation is everywhere and that conclusions are uncertain

TECHNOLOGY

Students are expected to use a TI-83, TI-84 or TI-89 graphing calculator throughout the course. Students who do not own their own calculator may rent one from the school. Calculator functions are demonstrated with a document camera.

Each student receives a (student version) of MINITAB to take home and use throughout the course. I also use MINITAB demonstrations throughout the year from the computer in my classroom.

Finally, students use the textbook's website (http://bcs.whfreeman.com/tps4e) to take online quizzes and experiment with a number of applets provided. I also have my own website where students can download worksheets or handouts (www.frankumstein.com) and I encourage every student to register at www.APCentral.collegeboard.com

PRIMARY TEXTBOOK

Starnes, Yates, Moore. *The Practice of Statistics*. Fourth Edition. New York: W.H. Freeman and Company, 2010. ISBN-13: 978-1-4292-4559-3

REMARKS

I grade assignments using *assignment quizzes* so that I can actually read (and correct) the conclusions drawn from random problems. One of my biggest challenges is getting students to answer questions *in context* of the problem and the assignment quizzes help me to help them do this better.

I would not and could not be as competent as I am without the training I received at an AP Institute and the advice I receive from AP Statistic teachers around the country (through AP Central's electronic discussion group). Both of these resources have been invaluable to me.

Using the *AP Statistics Course Description* as the basis for the content I teach in AP Statistics, I have also had to add or expand upon some topics which are covered on the International Baccalaureate (IB) Math Exams (but not on the AP Exam). At our school, most every AP course is also an IB course and AP Statistics is no exception.

COURSE OUTLINE

FALL SEMESTER		
BLOCK DAY*	**LESSON**	**ASSIGNMENT****
1	Introduction to Statistics	Read Pp xxviii – xxxi
2	Analyzing Categorical Data (1.1)	P. 7, 1-3; P. 23, 9, 14, 20, 22 34; Worksheet
3	Displaying Quantitative Data with Graphs (1.2)	P. 42, 37, 45, 49, 52, 53, 55, 65, 68
4	Review	Worksheet
5	Describing Quantitative Data with Numbers (1.3)	P. 70, 79, 81, 84, 89, 98, 105
6	Review	Review Problems; Online Quiz
7	**TEST** (Chapter 1)	
8	Describing Location in a Distribution (2.1)	P. 106, 9ab, 10, 20, 28, 32; Worksheet
9	Normal Distributions (2.2)	P. 131, 41, 43, 53, 54, 61, 63, 67
10	Review	Review Problems; Online Quiz
11	**TEST** (Chapter 2)	
12	Scatterplots and Correlation (3.1)	P. 158, 1, 3, 10, 11, 12; P. 160, 15, 17, 19, 22
13	Least-Squares Regression Line (3.2); Handout	P. 191, 38, 48a, 53, 54
14	Coefficient of Determination (3.2); Handout	P. 193, 58, 63; P. 200, R3.6
15	Residuals (3.2)	P. 192, 51, 55, 61, 67, 70; AP Free Response
16	Review	Review Problems; Online Quiz
17	**TEST** (Chapter 3)	
18	Sampling and Surveys (4.1)	P. 226, 1, 4, 11, 19, 24
19	Sampling Bias (4.1); Gallup Polls	P. 226, 6, 7, 27, 28, 30, 35
20	Experiments (4.2): Lurking Variables	P. 253, 45, 51-54, 61, 62, 72; AP Free Response
21	Using Studies Wisely (4.3); Review	Review Problems; Online Quiz
22	**TEST** (Chapter 4)	
23	Probability and Simulations (5.1);Table D	P. 294, 3, 8, 13, 21; AP Free Response
24	Probability Rules and Venn Diagrams (5.2)	P. 309, 40, 45, 49, 50, 53, 55, 56bc
25	Conditional Probability and Independence (5.3)	P. 329, 64, 66, 67, 69, 72, 75, 99
26	Review	Worksheet
27	Review	Review Problems; Online Quiz
28	**TEST** (Chapter 5)	
29	Discrete and Continuous Random Variables (6.1)	P. 353, 1, 4, 5, 7, 12, 16, 20
30	Transforming /Combining Random Variables (6.2)	P. 378, 35, 44, 38, 63
31	Binomial Random Variables (6.3)	P. 403, 69-72, 75, 77, 80, 81, 91
32	Geometric Random Variables (6.3)	P. 405, 95, 96, 97, 98, 99
33	Review	Review Problems; Online Quiz
34	**TEST** (Chapter 6)	
35	Sampling Distributions (7.1)	P. 428, 1-8, 15, 18
36	Sample Proportions (7.2)	P. 439, 29, 35, 37, 40
37	Sample Means (7.3)	P. 454, 49, 53, 56, 59
38	Review	Review Problems; Online Quiz
39	**TEST** (Chapter 7)	
40	Final Exam Information Sheet; Content Review	Handouts
41	**FINAL EXAM** (Chapters 1-7)	

*Our school operates on a Block 8 schedule; Classes meet for 90-minutes every other day

**All worksheets and handouts can be accessed for downloading or review at:
www.frankumstein.com

SPRING SEMESTER		
BLOCK DAY*	**LESSON**	**ASSIGNMENT****
1	Confidence Intervals (8.1)	P. 481, 1, 3, 4, 9-12
2	Estimating a Population Proportion (8.2)	P. 496, 27, 28, 31-34, 44, 45
3	Estimating a Population Mean (8.3)	P. 518, 56-59, 63-66, 68
4	Review	Review Problems: Online Quiz
5	**TEST** (Chapter 8)	
6	Significance Tests (9.1)	P. 546, 1-4, 11-14, 16, 17
7	Significance Tests (9.1)	P. 547, 19, 20, 23, 24; AP Free Response
8	Tests About a Population Proportion (9.2); Handout	P. 562, 33, 34, 37-40, 49, 51
9	Tests About a Population Mean (9.3)	P. 587, 63, 67, 68, 73, 80, 82, 86
10	Tests About a Population Mean (9.3)	P. 588, 69, 70, 89
11	Review	Review Problems; Online Quiz
12	**TEST** (Chapter 9)	
13	Comparing Two Proportions (10.1)	P. 622, 11, 12, 15-18, 22, 27
14	Review	AP Free Response
15	Comparing Two Means (10.2)	P. 654, 45, 51, 53, 61-64
16	Review	Review Problems; Online Quiz
17	**TEST** (Chapter 10)	
18	Goodness of Fit (11.1)	P. 692, 1- 4, 12,18
19	Test of Homogeneity (11.2)	P. 726, 37, 39; Worksheet
20	Test of Independence (11.2)	Worksheet; AP Free Responses
21	Review	Review Problems; Online Quiz
22	**TEST** (Chapter 11)	
23	Inference About the Model (12.1)	P. 761, 14d; Worksheet
24	Exponential Models (12.2)	Worksheet
25	Power Models (12.2); Handout	Worksheet
26	Inference Summary; Calculator Tests	Worksheet
27	Year-End Project	Handout
28	Format of AP Exam	Handouts (Format, Calculator, Content)
29	Practice AP Exam (MC)	Answer Sheet; Formulas
30	Practice AP Exam (MC)	
31	Practice AP Exam (FR)	
32	Practice AP Exam (FR)	
33	Make-Up Day	**PROJECT PROPOSAL DUE**
34	Grading/Scoring of AP Exam	Warm-Up Exercises
35	Project	
36	Project	
37	Project	
38	Project	
39	Project	
40	Project	
41	Project	
42	Project	
43	**PROJECT REPORT**	

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AP STATISTICS/IB MATH PROJECT

DESCRIPTION
In lieu of a final exam and in accordance with the IB requirements for Standard Level Math Studies candidates, you will:
a) Identify a researchable (testable) hypothesis
b) Design a randomized observational study, survey or experiment to test it
c) Carry-out the study, survey or experiment and collect the data (obtaining ≥ 30 values)
d) Analyze the resulting data

GROUP SIZE
IB candidates must do this project by themselves. Everyone else may do this project by him/herself or with a partner. However, if you do the project with a partner, I will expect more than with an individual project.

PROPOSAL
You must have an approved project no later than _____. To get approval, you must clearly complete the Project Proposal Form. If relevant, you must also make sure that your experiment/survey will be safe and ethical for human subjects.

TYPED AND DOUBLE-SPACED REPORT due no later than _____ and must include the following (in order):

5 points	A cover sheet with title (posed as a question), name(s) and date; IB candidates should include their candidate number.
5 points	An abstract of your report
10 points	Your null and alternative hypotheses clearly stated in words and mathematically
10 points	A description of how you carried-out your study/survey/experiment and a discussion on why/how you designed it
10 points	A description of things that went wrong and any suggestions on what you would have done differently
20 points	A description of the statistical test you used to test your hypothesis and the reason(s) for choosing the test you chose. Show all calculations; find a *P*-value and an appropriate confidence interval
10 points	A conclusion about your hypothesis using language that your Grandmother or Grandfather could understand
10 points	Appropriate format and all deadlines met
	APPENDIX:
10 points	All the data you gathered displayed in a table. If applicable, include good data summaries (means, standard deviations, 5-number summaries etc.) and a commentary on these summary statistics
10 points	A graph (or many graphs) of your data and commentary on what it shows. Use a box-plot, stem and leaf plot, scatterplot, histogram and/or pie chart.