

AP Statistics

Advanced Placement Statistics* is equivalent to an introductory college level statistics course. Students are introduced to the major concepts of collecting, organizing, and drawing conclusions from data. Students will study four broad areas of introductory statistics:

- Exploring Data: Observing patterns and departures from patterns
- Planning a Study: Deciding what and how to measure
- Anticipating Patterns: Producing models using probability and simulation
- Statistical Inference: Confirming models.

Prospective students should have completed a second year of high school algebra and possess a mathematical maturity that includes quantitative reasoning. Students also should have writing skills that allow them to express answers clearly and succinctly.

AP Statistics data analysis is dependent on the use of technology. Students should have access to computers that include software capable of doing data analysis. Students will be required to interpret output generated by statistical software programs. Students are not expected to learn how to use various statistical programs. In addition one of the following Texas Instruments calculators is required, TI-83, TI-83+, TI-84+, or a TI 89. The TI-83+ is the most popular calculator for AP Statistics. In most cases the calculator is sufficient but the fundamental tool of data analysis is the computer.

Students enrolled in AP Statistics are not expected to memorize tedious formulas but should concentrate their time on understanding the basic concepts on introductory statistics. Formulas will be available throughout the course and the students will have access to formulas and statistical tables on the AP Statistics exam administered by the College Board.

The required text is:

The Practice of Statistics: TI-83/89 Graphing Calculator Enhanced, Second Edition
Dan Yates, David S. Moore, Daren S. Starnes

ISBN 0-7167-4773-1

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Semester 1

PART I. ORGANIZING DATA: LOOKING FOR PATTERNS AND DEPARTURES FROM PATTERNS

1. Exploring Data
 - 1.1 Displaying Distributions with Graphs
 - 1.2 Describing Distributions with Numbers
2. The Normal Distributions
 - 2.1 Density Curves and the Normal Distribution
 - 2.2 Standard Normal Calculations

- 3. Examining Relationships
 - 3.1 Scatterplots
 - 3.2 Correlation
 - 3.3 Least-Squares Regression

- 4. More on Two-Variable Data
 - 4.1 Transforming Relationships
 - 4.2 Cautions about Correlation and Regression
 - 4.3 Relations in Categorical Data

PART II. PRODUCING DATA: SAMPLES, EXPERIMENTS, AND SIMULATIONS

- 5. Producing Data
 - 5.1 Designing Samples
 - 5.2 Designing Experiments
 - 5.3 Simulating Experiments

PART III PROBABILITY: FOUNDATIONS OF INFERENCE

- 6. Probability: The Study of Randomness
 - 6.1 The Idea of Probability
 - 6.2 Probability Models
 - 6.3 General Probability Rules
- 7. Random Variables
 - 7.1 Discrete and Continuous Random Variables
 - 7.2 Means and Variances of Random Variables

Semester 2

- 8. The Binomial and Geometric Distributions
 - 8.1 The Binomial Distributions
 - 8.2 The Geometric Distributions

- 9. Sampling Distributions
 - 9.1 Sampling Distributions
 - 9.2 Sample Proportions
 - 9.3 Sample Means

PART IV. INFERENCE: CONCLUSIONS WITH CONFIDENCE

- 10. Introduction to Inference
 - 10.1 Estimating with Confidence
 - 10.2 Tests of Significance
 - 10.3 Making Sense of Statistical Significance
 - 10.4 Inference as Decision
- 11. Inference for Distributions
 - 11.1 Inference for the Mean of a Population
 - 11.2 Comparing Two Means

- 12. Inference for Proportions
 - 12.1 Inference for a Population Proportion
 - 12.2 Comparing Two Proportions
 - 13. Inference for Tables: Chi-Square Procedures
 - 13.1 Test for Goodness of Fit
 - 13.2 Inference for Two-Way Tables
 - 14. Inference for Regression
 - 14.1 Inference about the Model
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**Textbook
and
Calculator**

A calculator capable of doing statistical tests is required. The TI-83 family is the most popular and is highly recommended.

Required: The Practice of Statistics, TI-83/89 Graphing Calculator Enhanced -- Dan Yates, David S. Moore, Daren S. Starnes
W.H. Freeman and Company, ISBN 0-7167-4773-167 Second Edition, 2003

Procedures

Throughout the course students will do assessments. There are different forms of assessment as outlined below.

1. **Discussions** - Students will post a response to a topic and will also be required to respond to another student's posting. Each discussion is valued at 10 points (5 points for initial post and 5 points for response post). Each unit starts and ends with a discussion board.
2. **Self Check quizzes** - The Self Check quizzes are designed to reinforce the basic concepts from the lessons. The student may retake the quizzes multiple times. These Self Checks will count toward the student's overall grade. Each question is valued at 1 point.
3. **Multiple Choice quizzes** - The Multiple Choice quizzes will cover material presented in several lessons. They are timed with an average of 2.5 minutes allowed per question. This closely mimics the AP Exam where a student is given 90 minutes to complete 40 multiple choice questions. The multiple choice quizzes may only be taken one time. Each question is valued at 2 points.
4. **Assignments** - Throughout the course students will be asked to demonstrate their knowledge of concepts by answering free response questions. The assignments are designed to prepare the student for the free response section of the AP exam. All assignments must be hand written and faxed to the instructor. The student may choose to scan the assignments and submit to the dropbox. Points for each assignment vary but average around 30 points.
5. **Exams** - Exams are two part, 48 points of multiple choice questions (12 questions, 4 points each) and 52 points of free response. The free response have the same format as the assignments mentioned above. The free response must be completed in the student's handwriting and faxed to the instructor. Scanning and submitting to a dropbox is also acceptable.