

## **Course Overview (with thanks to Jared Derksen, Rancho Cucamonga, CA; editing by Dave Bock)**

This course will cover the AP Statistics course description primarily through the use of four resources:

Bock, David E., Paul F. Velleman and Richard D. DeVeaux. *Stats: Modeling the World (2<sup>nd</sup> Ed.)* Boston: Pearson/Addison-Wesley, 2007.

Bock, D. and Craine, W, *Printed Test Bank and Resource Guide*, Boston: Pearson/Addison-Wesley, 2007

Carroll, Carver, Peters, & Ricks, *AP Statistics (AP Test Prep Series)*, Boston: Pearson/Addison-Wesley, 2007

College Board. *AP Statistics Free Response Problems*. New Jersey: College Board, 2006.

## **Course Planner**

### **Unit I: Exploring and Understanding Data**

BVD Chapters: 1-6

Time Frame: First 5 weeks of school

#### Week 1

- Intro to Stats (Chapter 1)
  - What is data? (Chapter 2)
  - Describing and displaying categorical data (Chapter 3)
  - Introductory discussion of independence(Chapter 3)
- Project: Chapter 3 Investigative Task from Teachers' Resource Guide

#### Week 2

- Describing and displaying quantitative data (Chapter 4)
- Project: Chapter 4 Investigative Task from Teachers' Resource Guide

#### Week 3

- Summary statistics for quantitative data (Chapter 5)
  - Outliers (Chapter 5)
- Project: Chapter 5 Investigative Task from Teachers' Resource Guide
- Computer labs:
- ActivStats activities exploring standard deviation
  - Analyzing univariate data with Data Desk software

#### Week 4

- The normal model (Chapter 6)
- The effect of linear transformations to data sets on summary statistics (Chapter 6)

## Week 5

- Review and assessment of Unit I
- Favorite Free Response problems to use:
- 1997 #1
  - 2000 #3
  - 2001 #1
  - 2002 Form B #5

Unit Assessment: A Part I Test from the Printed Test Bank, consisting of both multiple choice and free response questions.

## **Unit II: Regression**

BVD Chapters: 7-10

Time Frame: Weeks 6-9

## Week 6

- Displaying and describing scatterplots (Chapter 6)
  - Analyzing two-variable quantitative data:
    - Correlation and the coefficient of determination (Chapter 7)
- Computer lab:
- ActivStats activities exploring correlation

## Week 7

- Analyzing two-variable quantitative data:
    - Least-squares regression (Chapter 8)
    - Slope and y-intercept (Chapter 8)
- Computer lab: ActivStats activities exploring least squares regression
- Project: Chapter 8 Investigative Task from Teachers' Resource Guide

## Week 8

- Analyzing two-variable quantitative data:
    - Residuals and residual plots (Chapter 8)
    - Outliers and influential points (Chapter 9)
- Projects:
- BVD wandering point worksheet from the Resource Guide
  - Chapter 9 Investigative Task from Teachers' Resource Guide
- Computer labs:
- ActivStats activities exploring influential points
  - Creating regression models using Data Desk software
- Favorite Free Response problems to use:
- 1999 #1
  - 2002 #4
  - 2002 Form B #1
  - 2003 Form B #1

Assessment: Mid-unit test from the Printed Test Bank

### Week 9

- Transformations to achieve linearity (Chapter 10)
  - Review and Assessment
- Project: Chapter 10 Investigative Task from Teachers' Resource Guide
- Favorite Free Response problems to use:
- 1997 #6
  - 2004 Form B #1

Unit Assessment: A Part II Test from the Printed Test Bank, consisting of both multiple choice and free response questions.

### **Unit III: Collecting Data**

BVD Chapters: 11-13

Time Frame: Weeks 10-13

### Week 10

- Simulations and random numbers (Chapter 11)
- Project: Chapter 11 Investigative Task from Teachers' Resource Guide
- Favorite Free Response problem to use:
- 2001 #3

### Weeks 10 and 11

- Designing surveys via various methods (Chapter 12)
- Bias in surveys (Chapter 12)
- Randomization and representative samples (Chapter 12)

### Weeks 12 and 13

- Observational studies (Chapter 13)
  - Experimental design: (Chapter 13)
    - Control
    - Random assignment of treatment
    - Replication
    - Placebo & blinding
    - Blocking and matched pairs
    - Confounding and lurking variables
    - Statistically significant difference (introduction)
  - Review and assessment
- Project: Chapter 13 Investigative Task from Teachers' Resource Guide
- Favorite Free Response problems to use:
- 1997 #2
  - 1999#3
  - 2001 #4
  - 2002 #2
  - 2002 Form B #3
  - 2003 #4

Unit Assessment: A Part III Test from the Printed Test Bank, consisting of both multiple choice and free response questions.

Group Project: Over the next 3 weeks, students design a study, collect and summarize data, make a class presentation, and submit a written report. (Outlined in the Teacher's Resource Guide)

### **Unit IV: Probability**

BVD Chapters: 14-17

Time Frame: Weeks 14-18

#### Week 14

- Basic probability principles including complement, independence and mutually exclusive (Chapter 14)

#### Weeks 14 and 15

- Addition, multiplication and conditional probability rules (Chapter 15)  
Favorite Free Response problem to use:
  - 2003 Form B #2

#### Week 16

- Random variables (Chapter 16)
  - Expected value and standard deviation
  - Rules for transforming and combining random variables
- Group project presentations (will run over into next week, too)  
Favorite Free Response problems to use:
  - 2001 #2
  - 2002 Form B #2
  - 2004 #4

#### Weeks 17 and 18

- Geometric and binomial probability models (Chapter 17)
- Normal approximation for the binomial (Chapter 17)
- Review and assessment

Computer lab: use simulations (Chapter 11) to examine these topics

Unit Assessment: A Part IV Test from the Printed Test Bank, consisting of both multiple choice and free response questions.

### **Unit V: Inference for Proportions**

BVD Chapters: 18-22

Time Frame: Weeks 19-22

#### Week 19

- Sampling distributions and Central Limit Theorem (Chapter 18)  
Computer lab: Sampling distribution applet

### Weeks 19 and 20

- Confidence intervals for one proportion (Chapter 19)

### Weeks 20 and 21

- Hypothesis testing for one proportion (Chapter 20)
  - Type I and II errors and power (Chapter 21)
- Project: Chapter 20 Investigative Task from Teachers' Resource Guide

### Week 22

- Intervals and tests for two proportions (Chapter 22)
- Review and Assessment

Unit Assessment: A Part V Test from the Printed Test Bank, consisting of both multiple choice and free response questions.

## **Unit VI: Inference for Means**

BVD Chapters: 23-25

Time Frame: Weeks 23-25

### Week 23

- Confidence intervals and hypothesis tests for one mean (Chapter 23)
- Project: Chapter 23 Investigative Task from Teachers' Resource Guide

### Week 24

- Confidence intervals and hypothesis testing for two means (Chapter 24)
  - Confidence intervals and hypothesis testing for matched pairs (Chapter 25)
- Project: Chapter 25 Investigative Task from Teachers' Resource Guide

### Week 25

- Cumulative review and Assessment
- Group inference project: cumulative inference for proportions and means from Teachers Resource Guide
- Unit Assessment: A Part VI Test from the Printed Test Bank, consisting of both multiple choice and free response questions covering inference for both means and proportions (Units V and VI).

## **Unit VII: Inference for Counts and Slope**

BVD Chapters: 26-27

Time Frame: Weeks 26-27

### Week 26

- Chi-square goodness-of-fit test (Chapter 26)
  - Chi-square for homogeneity and for independence (Chapter 26)
- Project: Chapter 26 Investigative Task from Teachers' Resource Guide

### Week 27

- Confidence interval for slope (Chapter 27)
- Hypothesis testing for slope (Chapter 27)
- Cumulative review and assessment

**Unit Assessment:** A Part VII Test from the Printed Test Bank, consisting of both multiple choice and free response questions covering all inference topics (Units V, VI, and VII).

### **Review for the Exam**

Time Frame: Weeks 28-30

- Practice Free Response problems will be used extensively
- Practice work from the *AP Test Prep* review book

Assessment:

- A practice exam will be given.

### **Cumulative Project**

Time Frame: Weeks 31-36

Cumulative year-end project: Students design a study, collect and summarize data, analyze data using statistical inference procedures and computer software, make a class presentation, and submit a written report. (Outlined in the Teacher's Resource Guide)