Exam Guidelines
Statistics 20 : Introduction to Probability and Statistics
Summer 2014

Exam Details: The second exam will be Wednesday, August 13 in lecture, lasting 80 minutes. It will begin promptly at 9:10am, so arrive early if possible. It will end at 10:30am and will be held in the regular classroom. The exam is worth 30% of your grade. The exam will cover material from the second half of class (21 July 2014) up to and including material from lecture 26 (7 August 2014). There will be an exam review in lecture on Monday and Tuesday, 11 and 12 August 2014, so come prepared with questions. No notes will be allowed on the exam.

What to bring: You will need a working calculator, pencils or pens, and erasers. We will supply all necessary tables, and there will be room to work on the exam itself. There will also be scratch paper available to you as necessary. No notes will be allowed on the exam.

How to study: Go over problems–don’t just read the text. First, go over the sample exams, being sure to time yourself to simulate the 80 minutes you will have. Then, go over problems done in lecture, section, quizzes, and homework. Finally, if you have the time, work the problems recommended here. Work problems on your own, before consulting with a fellow student, the GSI, the instructor, or the answers. This will indicate what you should focus on when you review. Answers to the Exercise Sets are found in the back of your book. Some of the Review Exercises have been assigned as homework; all homework (and quiz) solutions are found in the glass cases on the third floor of Evans Hall. Come to office hours or the exam review with any questions you might have.

Material: Chapters 16 through 23, Chapters 26 through 29

• Probability with box models: Chapters 16, 17, 18
  – law of averages
  – expected value, standard error for sum of draws, average of draws, percentage of draws
  – box models–numeric, classifying and counting (0-1)
  – normal approximation to probability histogram (central limit theorem), continuity correction
• Box models in the real world: Chapters 19, 20, 21, 22, 23
  – different kinds of biases
  – types of samples (and their strengths and weaknesses).
  – EV and SE when sampling with replacement, correction factor
  – confidence intervals for percents, averages
• Hypothesis testing: Chapters 26, 27, 28, 29
  – z-test for averages and percentages
  – t-test for averages and percentages
  – two sample z-test for averages and percentages (independent boxes and experiments)
  – $\chi^2$ test for distributions, for independence
  – Practical vs. statistical significance, data snooping, role of model, importance of thinking about design, questions, etc
• Putting it all together: Ability to read a piece of writing (academic or news), and think critically about the statistical elements, including, but not limited to:
  – Bias, confounding
  – Mis-specified box model
  – Population vs. sample
  – Interpretation of hypothesis tests and/or confidence intervals


**Recommended Problems:** All problems are from Freedman, Pisani, and Purves, 4th edition. Answers to the Exercise Sets are found in the back of your book. Some of the Review Exercises have been assigned as homework; all homework (and quiz) solutions are found in the glass cases on the third floor of Evans Hall.

- **Chapter 16**
  - Set A: 1-8
  - Set B: 2-6
  - Set C: 1-3
  - Review: 1-8

- **Chapter 17**
  - Set A: 1-4
  - Set B: All
  - Set C: 1-3, 5, 8
  - Set D: All
  - Set E: 1-3, 7-9
  - Review: 1-6, 8-9, 11

- **Chapter 18**
  - Set A: 1, 2
  - Set B: 1-3, 5
  - Set C: 2, 5-8
  - Review: 4, 6, 9, 10, 12-14

- **Chapter 19**
  - Set A: 1-4, 11, 12
  - Review: 2, 4, 5, 6, 12

- **Chapter 20**
  - Set A: 1-4, 8
  - Set B: 1-4
  - Set C: All
  - Review: 2-6, 8, 12

- **Chapter 21**
  - Set A: 1-5, 9
  - Set B: 1, 2
  - Set C: 1, 2, 4-8
  - Review: 2-6, 8, 12

- **Chapter 22**
  - Review: 5, 7, 9

- **Chapter 23**
  - Set A: 1-7, 10
  - Set B: 1-7
  - Set C: 4-6
  - Set D: All
  - Review: 1, 3-5, 7-10, 12

- **Chapter 24**
  - Set A: 4, 5
  - Set B: 1, 2, 5
  - Set C: 1, 2, 4, 5
  - Set D: All
  - Set E: 1-5, 7, 10
  - Set F: 1-4
  - Review: 1-5, 7-8

- **Chapter 25**
  - Set A: 2-4
  - Set B: 3, 7-8
  - Set C: 2, 3
  - Set D: 5, 6
  - Review: 2-4, 6, 7, 9, 10

- **Chapter 26**
  - Set A: 1-3, 6, 8
  - Set C: All
  - Review: 1-9

- **Chapter 27**
  - Set A: 2
  - Set B: All
  - Set C: All
  - Set D: All
  - Set E: All
  - Review: 1-3, 5-9, 11-12