

UPCOMING EXAM

Exam on March 31, 1999

- ▷ **Date of Midterm Exam 2: Wednesday, Mar 31, 1999**
- ▷ **Time of Midterm Exam 2: IN CLASS, 9:30–10:20am**
- ▷ **Place of Midterm Exam 2:**
 - The exam will be held in our usual classroom, DH 2315
 - You may be directed by the TA's to overflow seating in DH 2105
- ▷ **Ground rules:**
 - Closed book, closed notes.
 - Bring a calculator. You will not be able to share or borrow one during the exam.
 - Bring one 8.5" by 11" sheet of paper with anything you want written on either side.
 - Show your work for numerical calculations, and justify your qualitative answers. You will not get full credit unless you do. Also you will not get any credit for a wrong answer if you do not show work.
- ▷ **Review Session:**
 - There will be a review session held by two TA's Monday Night Mar 29 after Supper.
 - Check with TA's in Lab for time and location.
 - **Bring Questions!** We will not have any prepared lecture! Everything we say will be in response to your questions.
- ▷ **Office Hours During Exam Week:**
 - Monday 2:00–3:00, OSC 219, Iuliana Ianus [CHECK]
 - Tuesday 2:00–4:00, Baker 232C, Brian Junker
 - Tuesday 6:30–7:30, Porter 226D, Alix Gitelman
 - Office Hours Wed Mar 31 are cancelled.
- ▷ **Labs and Homework**
 - Labs are cancelled Apr 1 and Apr 2.
 - Graded HW 9 will be inside Baker 132 on Tuesday Mar 30 for pickup.
- ▷ **All Class Materials are at:** <http://www.stat.cmu.edu/~brian/201/>

You are responsible for all class materials, reading, hw, and labs from Week 06 through Week 10, for the exam. In addition, we will assume you remember the main ideas and calculations from weeks 01 through 05.

▷ **What you should know for Exam 2:**• **Old Stuff**

1. Boxplots, stem-and-leaf plots, histograms; numerical summaries of central location and spread; 68%–95%–99.7% rule.
2. Correlation, Exploratory Regression Analysis, and Contingency Tables

• **New Stuff**

1. Simpson's Paradox, Interpretations
 - Lurking Variables in contingency tables and scatter plots
 - Simpson's Paradox: What is it? How can it happen?
2. Gathering Data
 - Sampling ideas: Population, Unit, Sample, Sampling Frame, Variable
 - Statistic vs. Parameter
 - Bias vs precision
 - Biased sampling methods
 - Simple Random Samples (SRS's)
3. Kinds of Studies
 - The difference between an Experiment and an Observational Study
 - Units, Explanatory Variable(s), Response Variable(s)
4. Experiments
 - Treatment(s), Control, Placebo, Blind/Double-Blind, Randomization
 - Pro's and Con's of some simple kinds of Experiments
 - How to randomize
5. Surveys
 - Volunteer sampling; Samples of convenience; Simple Random Sampling (SRS); Stratified and multistage random sampling; Pro's and Con's
 - Sources of error and bias—how to create/avoid.
 - Margin of Error* for a sample survey, and 95% Confidence Statements*
6. Causation vs. Association
 - How Lurking Variables undermine a causal argument: Confounding
 - Why randomized comparative trials can lead to a causal argument.
7. Probability
 - Basic calculations*: events, complements, unions, intersections, Venn
 - Analogy between conditional probability* and row/col percents
 - Law of Averages vs. Law of Large Numbers (Swamping out irregularities)
 - Random variable, mean*, SD*; binomial random variable
8. Central Limit Theorem and Normal Approximation
 - Applies to sums and averages of random samples.
 - When is it OK to use Z -scores with the 68–95–99.7 rule to estimate probabilities? How* do you do it?
 - Sample Size and the Square Root Law

* Know how to calculate these.