

Department of Mathematics
Pomona College

Math 58. Introduction to Statistics
Fall 2008

Course Outline

Time and Place: MW 2:45 pm – 4:00 pm Edmunds 114.
Instructor: Dr. Adolfo J. Rumbos
Office: Andrew 259
Phone/e-mail: ext. 18713 / arumbos@pomona.edu
Office Hours: MWF 9:15 am – 9:50 am or by appointment.
Text: *Introduction to the Practice of Statistics*, sixth edition,
by David S. Moore and George P. McCabe.

Course Description. Statistics may be defined as the art of making decisions based on incomplete information or data. The process of making those decisions is known as statistical inference. The emphasis in this course will be on statistical inference; in particular, estimation and hypothesis testing. There are other aspects surrounding this process, such as sampling and exploratory data analysis, which we will also touch upon in this course. We will also emphasize the acquisition of statistical reasoning skills. Thus, the main thrust of the course will not be the mere application of formulae to bodies of data, but the reasoning processes that accompany the involvement of statistics at the various stages of real world statistical applications: from the formulation of questions and hypotheses, experimental design, sampling and data collection, data analysis, to the presentation of results. We will use a combination of lectures, discussions, activities and problem sets which expose the students to the various issues that arise in applications of statistical investigations.

Assigned Readings and Problems. Readings and problem sets will be assigned at every lecture. Homework assignments will be collected on a weekly basis. Students are expected to do the reading and are strongly encouraged to work on every assigned problem. **Late homework assignments will not be graded.**

Grading Policy. Grades will be based on the homework, two 50-minute examinations, four short papers or reports, plus a final exam. The overall score will be computed as follows:

homework	15%
examinations	40%
four short papers	15%
final exam	30%

Tentative Schedule of Topics, Activities and Examinations

Date	Topic
W Sep. 3	Activity 1: <i>An age discrimination case?</i> Introduction to statistical inference
M Sep. 8	Randomization tests: Introduction to R Simulations and probability
W Sep. 10	
M Sep. 15	Activity 2: <i>Comparing two treatments</i> Introduction to hypothesis testing
W Sep. 17	Probability and distributions
M Sep. 22	Activity 3: <i>Cereal box problem</i> Random variables and expectations
W Sep. 24	Distributions
M Sep. 29	Activity 4: <i>Estimating the size of a population: Capture/Recapture</i> Introduction to estimation
W Oct. 1	Activity 5: <i>Estimating the size of a serially numbered population</i> Order statistics
M Oct. 6	Estimators
W Oct. 8	Point estimates and interval estimates.
M Oct. 13	Review
W Oct. 15	Exam 1
M Oct. 20	<i>Fall Recess.</i>
W Oct. 22	Activity 6: <i>Sampling words from a text.</i> Sampling issues
M Oct. 27	Sampling distributions
W Oct. 29	Activity 7: <i>To be announced</i>
M Nov. 3	Variables: parametric and non-parametric
W Nov. 5	Association between variables

M Nov. 10 Association between variables (continued)
W Nov. 12 Regression

M Nov. 17 Analysis of variance (ANOVA)
W Nov. 19 Activity 8: *To be announced*

M Nov. 24 Non-parametric analysis
W Nov. 26 Activity 9: *To be announced*

M Dec. 1 Review
W Dec. 3 **Exam 2**

M Dec. 8 Review
W Dec. 10 Review

Th Dec. 18 **Final Examination at 2:00 pm**