Math 207, Probability and Statistics
Fall Semester, 1993
Dr. Evelyn C. Bailey

TEXT: Introduction to Statistics. Howard B. Christensen

Content: Visual displays of data, measures of central tendency and of variablilty, classification of data, counting, probabilily, Bayes Theorem, probability functions, Chebyshev's Theorem, discrete distributions (binomial, hypergeometric, Poisson, uniform), continuous distributions (Gamma, exponential, normal, uniform), Central Limit Theorem, Confidence Invervals, Hypothesis Testing (for means and for proportions), ANOVA, Linear Regression (simple and multiple).

Goals: At the end of this course students should be able: to categorize data, to work various probability problems, to understand the role of functions in statistics, to describe major misuses of statistics, to recognize several standard distributions, to analyze interval data for which statistical tests involving difference of means and difference of proportions is needed, to check for inherent assumptions of statistical models that are included in this course, to interpret relationships in bivariate data, to understand the role of statistics in analyzing data and in inference.

Grading: Grades will be determined by student performance on four different problem sets, a final exam, and a few extra credit (optional) problems.

Problem Set 1 Data, Probability, Functions
(chapters 1, 2) DUE: TUESDAY, 9/28
Problem Set 2 Discrete and Continuous Distributions
(chapters 3, 4, 6) DUE: THURSDAY, 10/28
Problem Set 3 Confidence Intervals, Hypothesis Testing
(chapters 7, 8, 9) DUE: TUESDAY, 11/23
Problem Set 4 ANOVA, Linear Regression, previous topics
(chapter 10, plus above) DUE: AT THE BEGINNING OF THE FINAL EXAM PERIOD. PROBLEM SET 4 MUST BE TURNED IN PRIOR TO TAKING YOUR FINAL EXAM.

The first three problem sets will have 200 possible points each, the last problem set will have 250 possible points, the final exam will have a possible 150 points for a total of 1000 points.

In addition, there will be opportunities for extra credit work, announced in class. These are usually not the standard type problems but those that require more thought and some original work. Points earned on extra credit will be added to your total points that will determine your grade.

In general,

900 points and up	A
750 to 899 points	B+, B, B-
600 to 749 points	C+, C, C-
550 to 599 points	D
below 550 points	F

Some Policies: All problem sets will be given out one week before the due date. All problem sets are due at class time on the dates indicated. Fifty points will be deducted per day for late problem sets, however problem set 4 cannot be late since it is due at the beginning of your final exam period. Emergencies will be handled on an individual basis.

For work on problem sets, you may use your own notes (those you have taken in class), your text book, the computer facilities, and/or your own computer or calculator; however, you may not receive help from another person or talk to anyone about the problems on the problem sets. Specific instructions will be given for each extra credit problem or project. You will need to keep your class notes and homework problems well-organized and complete so that they will be useful to you on your problem sets and final exam .

Class attendance is important. You are responsible for work done in class. Homework assignments are attached and are for your benefit.

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK IN THIS CLASS! YOUR PROBLEM SETS AND ANY OTHER WORK OR TESTS ARE PLEDGED TO BE YOUR WORK IN ACCORDANCE WITH INSTRUCTIONS GIVEN FOR THE ASSIGNMENT.

Assignments

Tuesday, 8/24 — Introduction, data classification, graphical methods (sections 1.1, 1.2, 1.3)
p. 19: 1, 2; p. 63: 2; make a stem-and-leaf and histogram for test scores and final exams on page 4 of information handout.

Thursday, 8/26 — Moments, frequency, measures of central tendency and of variability (sections 1.4, 1.5, 1.6)
p. 29: 1, 6, 10; p. 34: 1; p. 44: 1 and use stem-and-leaf and make histogram.

Tuesday, 8/31 — Bivariate data, stem-and-leaf (sections 1.7, 1.8, 1.9)
handout 1; p. 45: 3; p. 57: 1; p. 71: 1,
Note: correlation for chapter data: $r = .8300$, $p < .0001$ (try Minitab in the computer laboratory)

Thursday, 9/2 — Probability postulates, addition rule (sections 2.1, 2.2, 2.3)
p. 79: 2, 3, 7, 8, 9; p. 84: 2, 3, 4, 6;
p. 88: 1, 2, 3, 4

Tuesday, 9/7 — multiplication rule, conditional probability, Bayes Theorem (sections 2.4, 2.5, 2.6)
p. 95: 1-4, 6-10; p. 101: 1, 2, 3, 7, 8, 9;
p. 106: 1-5, 7, 8, 10; handout 2

Thursday, 9/9 — counting (Appendix A)
p. 112: 2, 4, 6, 10, 11, 12; handout 3

Tuesday, 9/14 — Review Probability
RECEIVE PROBLEM SET 1

Thursday, 9/16 — Probability functions (sections 3.1)
p. 130: 1-9

Tuesday, 9/21 — Mean and variance, Chebyshev's Theorem (sections 3.2, 3.4)
p. 138: 3, 4, 11; p. 151: 2, 3, 5

Thursday, 9/23	Joint probability distributions (section 3.6) p. 159: 1, 2, 3, 8; **PROBLEM SET 1 DUE**
Tuesday, 9/28	Marginal, conditional, independence (section 3.7) p. 169: 4, 10; p. 178: 1, 3, 8; p. 187: 1, 2; handout 4
Thursday, 9/30	Discrete functions, binomial distribution (sections 4.1, 4.2) p. 202: 1, 2, 3
Tuesday, 10/5	Poisson, hypergeometric, and uniform distributions (sections 4.3, 4.4, 4.5) p. 211: 3, 4, 5, 6 (Hypergeometric) p. 215: 1, 3, 4, 9 (Poisson) p. 219: 2 (Uniform); handout 5
Thursday, 10/7	mid-semester break
Tuesday, 10/12	Continuous functions finish previous homework
Thursday, 10/14	Gamma and exponential distributions (sections 4.6, 4.7, 4.8) p. 229: 1, 6; p. 234: 2, 3
Tuesday, 10/19	Normal distribution and normal approximation to the binomial (section 4.9, 6.6) p. 244: 1, 2, 3, 9; p. 337: 1, 2, 3, 4, 6, 8 handout 6
Thursday, 10/21	Central Limit Theorem (section 6.2) RECEIVE PROBLEM SET 2
Tuesday, 10/26	Confidence intervals about a mean (section 7.5) p. 386: 3, 4, 5, 6, 7, 10, 12

Thursday, 10/28	Confidence intervals about a proportion (section 7.8) p. 404: 1, 2, 3, 4, 5, 8; handout 7 **PROBLEM SET 2 DUE**
Tuesday, 11/2	Hypothesis testing (sections 8.1, 8.2) p. 442: 1, 2, 3
Thursday, 11/4	Hypothesis testing related to means (sections 8.3, 8.4, 8.5, 8.6) p. 451: 1a, 2, 3a; p. 457: 1, 3, 4, 5, 8; p. 464: 1, 5, 7, 10; handout 8
Tuesday, 11/9	Hypothesis testing related to proportions (section 9.2) p. 516: 1, 5, 6, 8; handout 9
Thursday, 11/11	Median test and review correlation (class notes) handout 10
Tuesday, 11/16	Simple Linear Regression (section 10.4) p. 583: 5, 7, 8 RECEIVE PROBLEM SET 3
Thursday, 11/18	Multiple Linear Regression (section 10.4) handout 11
Tuesday, 11/23	Multiple Linear Regression continued **PROBLEM SET 3 DUE**
Thursday, 11/25	Thanksgiving Day
Tuesday, 11/30	ANOVA (section 10.1) handout 12
Thursday, 12/2	Last class day RECEIVE PROBLEM SET 4