Mathematics 107 - Introduction to Probability and Statistics
Fall, 2001 - Dr. Evelyn Bailey or Dr. Karen Rogers

Text: Elementary Statistics, 8th ed. Mario F. Triola with computer disc and formula sheet.

Materials: Calculator(TI-83) and Math 107 Notebook

Course Content: Visual displays of data, measures of central tendency and of variability, classification of data, counting, probability, Chebyshev's Theorem, normal distribution, binomial distribution, Central Limit Theorem, hypergeometric distribution, Poisson distribution, Confidence Intervals, Hypothesis testing (means, proportions, variances for both one population and two populations), Simple linear regression and correlation, Analysis of Variance (one way), Contingency Tables, nonparametric tests (Wilcoxon Rank-Sum and Kruskal-Wallis Tests). Emphasis is on inference.

Goals: At the end of this course students should be able to: categorize a data set; work various simple probability problems; understand the role of functions in statistics; describe major misuses of statistics, recognize several distributions and characterize them; analyze interval data for which statistical tests involving means, proportions, medians, rankings, and variances are the parameters; interpret relationships in bivariate data; know the difference between parametric and nonparametric statistics in relation to inherent assumptions of the general statistical model; recognize the limitations of statistics; understand the role of statistics in analyzing data and in inference; use a computer and/or a calculator to find measures of central tendency, measures of variability, basic test statistics; interpret statistical findings in relation to the situation from which data were drawn, describe the experimental nature of mathematical statistics, draw inferences using the vocabulary of statistics. The goal is for students to begin to be good consumers of information.

Grading: Grades will be determined by student performance on four (best) tests; three experiments and a comprehensive final exam:

5 tests @ 100	400 (drop lowest)	In general,	
3 experiments @ 50	150	A, A-:	765 points and above
1 final	300	B+, B, B-:	680 - 764 points
	850 points	C+, C, C-:	595 - 679 points
		D+, D:	510 - 594 points
		F:	below 510 points

Each test will have 100 points and will be given at 2:15 on the following Fridays in Seney Hall: September 14, October 5, October 26, November 16, and December 7. Tests should take around 75 minutes. The best four grades will be used to help determine your grade. **There are no provisions for making up tests.** Emergencies will be handled on an individual basis. It is the responsibility of the student to provide the

instructor with appropriate verification for any special testing needs at least two days prior to the testing time so arrangements may be made.

Each experiment has a potential of 50 points. Example experiments are provided in the notebook for this course. All experiments require group work. Each student is expected to participate in a somewhat "equal" manner. Each student will provide individual contributions on a signed form that must accompany each experiment. **No experiment will be accepted after the due date and time.**

Your final exam will include material selected from the entire course. The final exam will be given at the time designated on the final exam schedule.

You may use formula sheets that are provided and your calculator for appropriate portions of tests, experiments, and the final exam. Room assignments for Friday afternoon tests are as follows: Seney 215 (11:30 TTh Rogers), Seney 209 (12:30 TTh Rogers), Seney 310 (10:00 TTh, E.C. Bailey).

Homework: Class time will be used to enrich topics in statistics but will not be used to summarize information from the text. It is the student's responsibility to read the textbook. Homework problems will not be collected but are to benefit the student. Basic problems and concepts information for which the student is responsible is included in the notebook for this course.

To do well in this course, the average student will need to study about 3-4 hours outside of class for every class meeting or around 6-8 hours per week. Preparing experiments and studying for tests will take additional time.

Attendance: Students are expected to attend all classes since each student is responsible for work covered in class. An inordinate amount of absences will be handled in accordance with school policies.

Students are expected to take tests at the scheduled times. Any conflicts, problems, or emergencies will be handled on an individual basis. Since one test grade is dropped, there are **no provisions for making up tests.** Students must be present in order to take tests. Experiments involve group work that **can not be made up**. Students must be present on the day the experiment is assigned to be in a group and have a grade for the assigned experiment.

Tutors: Student tutors are scheduled for a limited amount of time per week, in the evenings, in the Gregory Study room. Homework problems, may be discussed with tutors. A listing of tutors for mathematics courses, with times and places, may be found posted outside the mathematics offices after the first week of classes.

Other Resources: (1) The library has on reserve a set of videos with topics from the text and presented by Triola (the author). These may be checked out for one hour and viewed. (2) A web cite is available for resources. http://www.awlonline.com/triola. (3) There is a single Math 107 conference cite through LearnLink for students enrolled in Math 107.

Office Hours: Check with your instructor. Offices are located on the first floor of Seney Hall (Rogers) and on the third floor of Seney Hall (Bailey).

HONOR CODE: THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR POINTS TOWARD YOUR GRADE. ALL SUCH WORK WILL BE PLEDGED TO BE YOURS AND YOURS ALONE. YOUR CONTRIBUTIONS ON ANY EXPERIMENT ARE TO BE HONESTLY STATED. YOUR TESTS REPRESENT YOUR WORK AND YOURS ALONE. YOUR SIGNATURE IS YOUR PLEDGE.

Topics and Homework Assignments

8/30 (Th) Introduction to Statistics
- Read Chapter 1
- Section 1-2, p. 10: 1-20
- Section 1-3, p. 15: 1-16

9/4 (Tu) Descriptive Statistics
- Section 1-4, p. 23: 1-25
- Review, p. 26: 1-6; Cumulative, p. 28: 1-8
- Read Chapter 2
- Section 2-2, p. 40: 1,5,9,13,15,17,19,21,22
- Section 2-3, p. 51: 5,7,13,14,17,24

9/6 (Th) Descriptive Statistics
- Section 2-4, p. 65: 3,8,9,14,17,18,23
- Section 2-5, p. 81: 3, 8, 9, 20-25, 29, 32, 34
- Section 2-6: p. 91: 1, 3, 6
- Review, p. 106: 1-4, 6
- Notes for Descriptive Statistics

9/11 (Tu)Counting
- Read Chapter 3
- Section 3-7, p. 164: 1-30

9/13(Th) Review for Test 1

Test 1 at 2:15 on Friday, September 14 in Seney Hall in assigned rooms.
(Chapters 1, 2 and counting)

Section II

9/18(Tu)Laws of Probability
Section 3-2, p. 123: 1-30, 34
Section 3-3, p. 132: 1-24, 25, 26
Section 3-4, p. 140: 1-24, 25, 26, 27
Section 3-5, p. 149: 1-20
(Not 3-6)
Chapter 3, p. 170: 1-16; p. 171: 1,2
Notes for Counting and Probability

9/20(Th) Probability Distributions
Read Chapter 4
Section 4.2, p. 190: 1-10, 13, 16, 18, 19, 25
Finish previous homework

9/25 (Tu) Binomial and Poisson Distributions
Section 4.3, p. 201: 1-10, 17-20, 25-36 (Use method 1)
Section 4.4, p. 207: 1-16, 17
Section 4.5, p. p. 213: 1-10
Chapter 4, p. 217: 1-5

9/27 (Th) Normal Distribution
Read Chapter 5
Section 5.2, p. 239: 1-40, 41, 43
Section 5.3, p. 245: 1-24
Section 5.4, p. 252: 1-10, 17-19, 21, 23

10/2(Tu) Central Limit Theorem, Normal Approximation to the Binomial
Section 5.5 p. 263: 1-20
Section 5-6, p. 275: 1-20, 24
Chapter 5, p. 286: 1-10, p. 288: 1,2;
Notes for Probability Distributions

10/4(Th) Review
Experiment 1 assigned

Test 2 at 2:15 on Friday, October 5 in Seney Hall in assigned rooms.
(Chapter 3, 4, 5)

Section III

10/9 (Tu) Confidence Intervals-Means
Read Chapter 6
Section 6-2, p. 309: 1-25
Section 6.3, p. 320: 1-16, 21, 23, 25, 26, 27
Section 6.4, p. 327: 1-10

10/11(Th) Confidence Intervals - Proportion and Introduction to Hypothesis Testing
Section 6.5: p. 337: 1-6, 11, 12, 15-22, 27-34, 41
(Not 6.6)
Chapter 6: p. 355: 1-10, p. 357: 1 (not l), 2
Read Chapter 7
Section 7.2, p. 378: 1-36, 37, 39

Midsemester Break 10/15 and 10/16

10/18(Th) Hypothesis Testing-Means
Sectopm 7-3, p. 394: 1-20 odd
Section 7-4, p. 405: 1-21 odd, 30
Experiment 1 due

10/23(Tu) Hypothesis Testing - Proportions
Section 7-5, p. 414: 1,2,10,11,18,19
Chapter 7, p. 426: 1-10; p. 429: 1-4
Notes for Inference 1

10/25 (Th) Review

Test 3 at 2:15 on Friday, October 26 in Seney Hall in assigned rooms
(Chapters 6 and 7)

Section IV

10/30 (Tu) Inferences from Two Samples (Sections 8.2, 8.3)
Read Chapter 8
Section 8.2, p. 444: 1-15 odd
Section 8.3, p. 454: 1-13 odd, 12, 14

11/1 (Th) Inferences from Two Samples
Section 8.4, p. 466: 1-15 odd, 18
Section 8.5, p. 476: 1, 3, 4, 5, 9, 11, 16

11/6(Tu) Inference from Two Samples
Section 8.6(not case 3), p. 488: 1, 3, 5, 6, 7, 8, 9
Chapter 8, p. 494: 1-7; p. 497: 4
Notes for Inference 2

11/8 (Th) Correlation and Regression (formal hypothesis testing)
Read Chapter 9
Section 9.2, p. 520: 1-15 odd and find t-values, 17-20 all, 23
Section 9.3, p. 535: 1,5,9,11,15,17
Experiment 2 assigned

11/13 (Tu) Regression
Section 9.4, p. 545: 1-8, 9
Section 9.5, p. 555: 1-4, 5-8
Section 9.6, p. 562: 5-8
Chapter 9, p. 565: 1, 5-8

11/15(Th) Review

Test 4 on Friday, November 16 at 2:15 in assigned rooms.
(Chapter 8 and 9)

Section V

11/20 (Tu) Contingency Tables
Read Chapter 10
Section 10.2, p. 584: 1-4, 9, 13
Section 10.3, p. 598: 1-11 odd, 15
Chapter 10, p. 605: 1-5
Experiment 2 due

Thanksgiving Break 11/22 - 11/23 (Thursday, Friday)

11/27 (Tu) ANOVA
Read Chapter 11
Section 11.2, p. 626: 1,2,3 (put in table form), 7
Section 11.3, p. 638: 1-8
Notes on Additional Parametric Models
Experiment 3 assigned

11/29 (Th) Wilcoxon Test and Kruskall-Wallis
Read Chapter 13
Section 13.4, p. 708: 1-4 all
Section 13.5, p. 716: 1,3,7
History Section of Notebook

12/4 (Tu) Rank Correlation
Section 13.6, p. 726: 1,2,7,8,13,14
Chapter 13, p. 741: 4,9,11,12
Read pages 756-759
Notes for Nonparametric Models
Experiment 3 due

12/6(Th) Review

Test 5 on Friday, December 7 at 215 in assigned room.
(Parts of Chapters 10, 11 and 13)

12/11(Tu) Last Class Day
Test 5 Returned

Final Exams according to the Exam Schedule. Final Exams are given in the classroom assigned for your class.