

**Mathematics 107 - Introduction to Probability and Statistics**  
**Fall, 2002 – Dr. Hiram Johnston**

**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..

**Course Overview:**

This course is designed as an activity centered course in which students are encouraged to engage in doing statistics with appropriate technological tools. The course is structured to help students develop an understanding of the principles and practices of probability and statistics. Lecture will be held to a minimum with the students engaged in discovery and exploration of statistical realities and probabilistic relationships. The instructor will attempt to facilitate and guide student exploration and discussion to insure that students learn appropriate statistical techniques and concepts. The explorations and discussions will be fully supported with technology using the TI-83 calculator and appropriate computer tools. Much of the course is devoted to developing students into competent interpreters and investigators of statistical data and information. The course will require students to read and reflect on the content developed in the textbook assignments and come to class prepared to participate in a discussion of the ideas presented in the textbook.

**Grading:** Grades will be determined by student performance on tests, labs, projects, and a comprehensive final exam:

5 tests @ 100.....	400 (drop lowest)
3 stat-projects @ 25 pts....	75
10 Labs @ 10 pts.....	100
1 final.....	150
Total Points.....	725points

In general,  
A, A-: 652 points and above  
B+, B, B-: 580 – 651 points  
C+, C, C-: 508- 579 points  
D+, D: 435 - 507points  
F: below 510 points

Each test will be given at 2:15 on Fridays in Seney Hall as indicated the teaching calendar . Tests should take approximately 75 minutes. You are responsible for all work. No make-up tests will be given unless prior arrangements are made. Your best four test grades will be used in determining your grade. All projects 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 project will be accepted after the due date and time. The labs will be started as in-class activities and completed outside of class. The labs are due the next class period. 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, labs, and the final exam.

**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 3-4 hours outside of class for every class. Preparing projects and studying for tests will take additional time.

**Attendance:** Students are expected to attend all classes. 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. Projects involve group work that can not be made up. Students must be present on the day the project is assigned to be in a group and have a grade for the assigned experiment. Labs will be started as in-class activities and completed outside of class. Each lab is due the next class period.

**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>.

**Office Hours:** Check with your instructor.

**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.

<p style="text-align: center;"><b>Teaching Calendar</b> <b>Tentative Schedule of Topics and Homework Assignments</b></p>
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**Section I**

8/29 (Th) **Introduction to Statistics**

Read Chapter 1

Section 1-2, p. 10: 1, 2,4,5,6,9,10,12,14

Section 1-3, p. 15: 1, 3, 6,10,14

Lab #1

9/3 (Tu) **Descriptive Statistics**

Section 1-4, p. 23: 1,3,5,8,9,10

Review, p. 26: 1,3,5,6; Cumulative, p. 28: 1-8

Read Chapter 2

Section 2-2, p. 40: 1,5,9,13,15,17,19,21

Section 2-3, p. 51: 5,7,13,14,17,24

9/5 (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

Lab #2

9/10 (Tu) **Counting**

Read Chapter 3

Section 3-7, p. 164: 1,3,5,10,12,15,16,21

9/12(Th) **Review for Test 1**

**Test 1 at 2:15 on Friday, September 13** in Seney Hall in assigned rooms.

(Chapters 1, 2 and counting)

## **Section II**

### **9/17(Tu) Laws of Probability**

Section 3-2, p. 123: 2, 4,5, 9,14, 17,21,30,34

Section 3-3, p. 132: 1,3,5,7,9,13,15,17,23 25

Section 3-4, p. 140: 1,35,7,10,16,21,24 25

Section 3-5, p. 149: 3,5,13,15,17,20 (omit Section 3-6)

Chapter 3, p. 170: 1,3,5,7,9, 14 ; p. 171: 1,2

Notes for Counting and Probability

Lab #3

### **9/19(Th) Probability Distributions**

Read Chapter 4

Section 4.2, p. 190: 1,3,5,9,12,19, 25

### **9/24(Tu) Binomial and Poisson Distributions**

Section 4.3, p. 201: 1,3,5,7, 17,19, 25, 27,31 (Use method 1)

Section 4.4, p. 207: 1,5,9, 17

Section 4.5, p. 213: 1,3,5,9

Chapter 4, p. 217: 1,3,5

Lab #4

### **9/24 (Th) Normal Distribution**

Read Chapter 5

Section 5.2, p. 239: 5,7,9,13,15,17,29,31

Section 5.3, p. 245: 1,3,5,7,9

Section 5.4, p. 252: 2,4,5,13 17, 23

### **10/1(Tu) Central Limit Theorem, Normal Approximation to the Binomial**

Section 5.5 p. 263: 1,3,5,13,15 Section 5-6, p. 275: 1,5,9,17, 21

Chapter 5, p. 286: 1,4,7,10 p. 288: 1,2; Lab #5

Notes for Probability Distributions

### **10/3(Th) Review**

Project #1 assigned

Test 2 at 2:15 on Friday, October 4 in Seney Hall in assigned rooms.

(Chapter 3, 4, 5)

### **Section III**

#### **10/8 (Tu) Confidence Intervals-Means**

Read Chapter 6

Section 6-2, p. 309: 1,5,7,9,11,17

Section 6.3, p. 320: 1,3,5,7,9,13, 21, 23, 25

Section 6.4, p. 327: 3,5,9

#### **10/10(Th) Confidence Intervals - Proportion and Introduction to Hypothesis Testing**

Section 6.5: p. 337:1,3,5,9, 11, 13, 15,19,21,25 (Omit 6.6)

Chapter 6 Review, p. 355: 1,3,5,7 Lab#6

Read Chapter 7

Section 7.2, p. 378: 1,3,5,9,11,13,15,17,19,25,27,29,31

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### **Midsemester Break 10/14 and 10/15**

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#### **10/17(Th) Hypothesis Testing-Means**

Section 7-3, p. 394: 1-17 odd

Section 7-4, p. 405: 1,3,5,9,15,23 **(Project # 1 due)**

#### **10/22(Tu) Hypothesis Testing - Proportions**

Section 7-5, p. 414: 1,3,7,11,15 (Omit 7-6)

Chapter 7, p. 426: 1,3,6,9; p. 429: 1,2 Notes for Inference 1

Lab #7

#### **10/24 (Th) Review Test #3**

Test 3 at 2:15 on Friday, October 25 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: 1-11 odd

Section 8.3, p. 454: 1-9 odd, 12

#### **10/31 (Th) Inferences from Two Samples**

Section 8.4, p. 466: 1,5,7,11,13

Section 8.5, p. 476: 1, 3, 4, 5, 9, 11

#### **11/5(Tu) Inference from Two Samples**

Section 8.6(not case 3), p. 488: 1, 3, 5, 6, 7, 9

Chapter 8, p. 494: 1-7 odd; p. 497: 1,2 Lab#8

Notes for Inference 2

**11/7(Th) Correlation and Regression (formal hypothesis testing)**

Read Chapter 9

Section 9.2, p. 520: 1-15 odd

Section 9.3, p. 535: 1,5,9,11,15

**Project #2 assigned**

**11/12 (Tu) Regression**

Section 9.4, p. 545: 1-11 odd

Section 9.5, p. 555: 1-4

Section 9.6, p. 562: 5-8

Chapter 9, p. 565: 1,3,5 Lab#9

**11/14(Th) Review for Test #4**

Test 4 on Friday, November 15 at 2:15 in assigned rooms.

(Chapter 8 and 9)

**Section V**

**11/19 (Tu) Contingency Tables**

Read Chapter 10

Section 10.2, p. 584: 3,4,8, 9

Section 10.3, p. 598: 1,3,5,10

Chapter 10, p. 605: 1-5; Lab #10

**Project# 2 due**

**11/20 (Th) 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

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Thanksgiving Break 11/28 - 11/30 (Thursday, Friday)

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**11/ 26 (Tu) Wilcoxon Test and Kruskal-Wallis**

Read Chapter 13

Section 13.4, p. 708: 1-4 all

Section 13.5, p. 716: 1,3,8

History Section of Notebook

**12/3 (Tu) Rank Correlation**

Section 13.6, p. 726: 1,2,7,8,13

Chapter 13, p. 741: 4,9,11,12

Read pages 756-759; Notes for Nonparametric Models

**12/5(Th) Review for Test #5**

**Project 3 due**

Test 5 on Friday, December 6 at 215 in assigned room.  
(Parts of Chapters 10, 11 and 13)

**12/10(Tu) Last Class Day**

Test 5 Returned ; Review for Final

Final Exams according to the Exam Schedule.

Final Exams are given in the classroom assigned.

**The syllabus as planned is tentative and changes will need to be made to accommodate the needs of the students.**

**Notes:**