

**SAN DIEGO STATE UNIVERSITY**  
**Graduate School of Public Health**  
**Division of Epidemiology and Biostatistics**

**PH 602 Biostatistics Fall 2006 3 units**

<u>Sect</u>	<u>Day</u>	<u>Time</u>	<u>Location</u>	<u>Sched No.</u>
1	TH	7:00pm –9:40pm	HH214	25815

**Instructor:** Ming Ji, PhD  
**Office phone:** (619) 594-3454  
**E-mail:** [mji@mail.sdsu.edu](mailto:mji@mail.sdsu.edu)

**Office location:** HT230  
**Office hours:** TH 2:00pm – 4:00pm

**E-mailing list:**

During the semester I plan to use an e-mailing list to send out course-related materials—announcements, files, weblinks, etc. *By the end of the second week of classes*, send me an e-mail with the following Subject line: “PH 602 mailing list” (omit the quotation marks). I will then add your e-mail address to the list.

**Required texts:**

Rosner, *Fundamentals of Biostatistics*, 6th Edition.  
 Alcaraz, *PH 602 Lecture Notes, Fall 2006*.

**Calculators:**

Students should have a pocket calculator capable of performing the basic arithmetic operations, square root,  $1/x$ ,  $\ln$ , and  $e^x$  functions.

**Grading System:**

Exam I: 25%	93 – 100 = A	73 – 77 = C
Exam II: 25%	90 – 93 = A-	70 – 73 = C-
Final Exam: 50%	87 – 90 = B+	67 – 70 = D+
	83 – 87 = B	63 – 67 = D
	80 – 83 = B-	60 – 63 = D-
	77 – 80 = C+	0 – 60 = F

**Exams:**

All exams will have an in-class portion (to be taken on the “Date Out” date and *turned in the same day*) and a take-home portion (handed out on “Date Out”, to be turned in on “Date Due”).

<u>Exam</u>	<u>Date Out</u>	<u>Date Due</u>	<u>Covered</u>
I	09/28/06	10/05/06	Ch 3 – 6
II	11/9/06	11/16/06	Ch 7, 8, 9, 10*
Final	12/07/06	12/14/06	Comprehensive

\* Parts of Ch 10 and Ch 13

**Academic Ethics:**

SDSU has a strict code of ethical conduct which students are expected to follow. See <http://www.sa.sdsu.edu/srr/judicial/StudentConductCode.html> for details. In particular, cheating on the exams will not be tolerated. You may not work together on the exams, may not copy answers from other students, and may not allow other students to copy your answers. Anyone caught cheating will face disciplinary action.

**Exercises:**

Exercises will include problems assigned from the text or from other sources. Although the exercises will not be graded, you are expected to complete them. The exam problems are similar to those in the exercises and, therefore, it is to your benefit to work the exercises. Solutions will be on reserve in the library. If time permits, some exercises may be discussed in class.

**Attendance/Punctuality:**

While attendance is not required except for exam dates, students are strongly encouraged to attend every class meeting and to be punctual. On exam dates, the exam will start at 7:00pm sharp and will end at a specific announced time. Those who arrive late on exam dates will not be allowed to work past the end time to complete their exams.

**Prerequisite:**

Passing the competency exam in basic statistical methods or successful completion of MATH 249 (Introduction to Biometry) or an approved basic statistics course within the past three years. Students *must* complete the prerequisite prior to enrollment.

**Background:**

Students are expected to know descriptive statistics (Ch 2, Rosner) and, therefore, this material will not be covered in the course. Students should be familiar with the following topics: basic concepts of probability (3.1 – 3.6, Rosner), the binomial distribution (4.8 – 4.9), the normal distribution (5.3 – 5.4), basic concepts of estimation (6.1 – 6.3), and basic concepts of hypothesis testing (7.1 – 7.2). These topics will be reviewed in the lectures; however, extensive discussions of this material will *not* be pursued.

**Goals of the Course:**

The student will learn basic biostatistical methods used in biomedical and public health research. Upon the completion of this course the student should be able to apply basic biostatistical techniques to the analysis of research data and to critically review papers and journal articles that use statistics.

**Learning Objectives:**

In this course, students will learn basic biostatistical methods used in biomedical and public health research. Students will be able to recognize and apply the appropriate biostatistical procedures to the analysis of health-related studies. Students will learn

1. To recognize the appropriate use of the binomial, normal, Student's  $t$ , chi-square and  $F$  distributions in estimation and hypothesis testing.
2. To describe the relationship between populations and samples, and the crucial role that random sampling plays in statistics.

3. To estimate such parameters as means, variances, and proportions, and to test hypotheses about these parameters (confidence intervals, one-sample test for proportion, one-sample  $t$ -test, two-sample  $t$ -test, paired  $t$ -test).
4. To apply nonparametric tests (Wilcoxon signed-rank test, Wilcoxon rank-sum test) when the underlying distributional assumptions are not met.
5. To assess the association—through relative risk or odds ratio estimation and through hypothesis testing (contingency tables)—between two variables when both variables represent groupings into categories or classes.
6. To understand the appropriate use of simple linear regression and correlation, and to estimate parameters and test hypotheses about linear relationships.
7. To complete a one-way analysis of variance model for comparing three or more means, and to describe procedures for performing multiple pairwise comparisons among these means.

---

**Course Outline for PH 602**

<u>Topic</u>	<u>Chapters in Text</u>
Review of basic concepts of probability	3.1 – 3.6
Applications of Bayes' rule	3.7
Probability distributions	
Discrete	
Basic ideas	4.1 – 4.7
Review of the binomial distribution	4.8, 4.9
Continuous	
Basic ideas	5.1, 5.2
Review of the normal distribution	5.3, 5.4
Conversion from normal to standard normal	5.5
Normal approximation to binomial	5.7
Review of populations and samples	6.1, 6.2
Review of random samples and random number tables	6.3
Sampling distribution	6.5
Estimation: Point and interval	6.5, 6.7, 6.8
Hypothesis testing	
Review of basic concepts	7.1, 7.2
One-sample problem	7.3 – 7.7, 7.9
Two-sample problem	8.1 – 8.7, 8.10
Nonparametric statistics	9.1, 9.3, 9.4
Hypothesis tests for categorical data	10.1 – 10.6, 13.3, 13.5
Simple linear regression	11.1 – 11.5
Correlation	11.7, 11.8
Analysis of variance	12.1 – 12.4

---