

ST 710/HE710/HP750 Biostatistical Methods Spring 2009

MEETINGS: Lecture/Lab Thursdays 5:30 - 8:30 in STC 337

1 Course Instructor

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Office Hours: Mon 10-10:45; Tu 12-1; Wed 12-12:45; Th 11-12, 4:30-5:30 (priority to graduate class); Fri 2-3, and by appointment.

Angel: angel.usp.edu Course-related documents (lectures, homeworks, projects, SAS info, handouts, etc.) will be posted on Angel.

2 Course Description

This course covers basic statistical techniques that are important for analyzing data arising from the biological sciences, from the pharmacological sciences, from public health and health policy related research, and from business and marketing. The main subject areas are: descriptive statistics, elements of probability, statistical inference using parametric and nonparametric methods, analysis of variance within the context of specific types of experimental designs, multiple linear regression analysis, and analysis of categorical data using contingency tables and logistic regression. Examples and projects will be developed taking into consideration the field of study of the students enrolled in the course. The statistical analysis software SAS will be used to perform basic and advanced statistical analysis of data.

3 Course Goals/Objectives: the learning objectives for the course are:

- I. Students will learn the basic terminology of probability and statistics, and will learn the use of appropriate statistical techniques.
- II. Students will be able to use statistical procedures to describe, analyze, and interpret data and perform analyses using SAS, the standard statistical software used in the health sciences.
- III. Students will be able to give an informed critique of the statistical methods used in research.
- IV. Students will learn the process of a statistical investigation:
 - a) understand the problem;
 - b) organize the information;
 - c) choose relevant probability or statistical methods;
 - d) carry out the statistical analysis;
 - e) communicate the solution.

4 **Course Text : No textbook is required.**

Two Supplemental Texts:

1. *Biostatistics: A Foundation for Analysis in the Health Sciences*, 8th edition, Wayne W. Daniel, Wiley; 2005 [ISBN: 0471456543].
2. *Fundamentals of Biostatistics*, 6th edition, Bernard Rosner, Duxbury Thompson Learning; 2005 [ISBN: 0534418201].

5 **Tentative Course Outline/Weekly Schedule**

- Week 1: Overview of the role of statistics.
Data. Variables. Scientific method
- Week 2: Sample and population. Survey and experiments. Sampling methods.
- Week 3: Descriptive statistics: graphical and numerical summaries.
- Week 4: Probability and probability distributions.
- Week 5: Statistical inference for means and proportions:
- point estimates
- confidence intervals (using parametric and nonparametric methods)
- Week 6: Statistical inference for means and proportions:
- tests of significance (using parametric and nonparametric methods).
- Week 7: More on statistical inference. Tentative date for midterm exam.
- Week 8: One-way analysis of variance.
- Week 9: Two-way and multi-way analysis of variance.
- Week 10: Simple linear regression.
- Week 11: More on Simple linear regression.
- Week 12. Multiple linear regression: transformations; diagnostic methods and examination of submodels.
- Week 13. Analysis of categorical data: contingency tables.
- Week 14. Analysis of categorical data: logistic regression model.
- Week 15: Final Exam during final exam week.

6 **Evaluation and Grading**

Course grades will be determined by the student performance on a midterm exam, a final exam, 2 projects and homeworks. Exams will be during regular class hours and a formula sheet will be permitted. Both projects will be individual projects. The first project will involve data analysis using SAS. The second project will involve the critique of the statistical inference of a research paper article.

The percentages are the following:

- ? Midterm exam 25%
- ? Final exam 30%
- ? Projects 25%
- ? Homework 20%

Grades will be computed according to the following system:

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Grade between:	97 and 100	93 and 96	90 and 92	87 and 89	83 and 86	80 and 82	77 and 79	73 and 76	70 and 72	67 and 69	63 and 66	60 and 62	0 and 59

Makeup Exams

University policy states that midterm and final exams can be made up for legitimate (documented) absences, such as verified illness, participation in other University-sponsored activities, jury duty, military service, or religious observances. If you must miss an exam, make arrangements as far in advance as possible. Talk to the instructor before/after class or during office hours to make arrangements. Any makeup of the final exam must be arranged through the registrar's office.

Incomplete

An incomplete is permitted only in cases of exceptional circumstances and following consultation with the instructor. In such cases an "I" grade will require a specific written agreement between the instructor and the student specifying the time and manner in which the student will complete the course requirements. Extension for completion of the work will not exceed one year.

7 Other Course Information and Policies

Student Conduct, Scholastic Dishonesty and Sexual Harassment Policies

Academic integrity is at the center of the educational experience at USP. Students are therefore expected to uphold the highest standards of academic integrity and not engage in nor tolerate academic dishonesty. Academic dishonesty includes, but is not limited to, fabrication, cheating or plagiarism. Any violation of academic integrity will be investigated and, where warranted, the student will receive appropriate sanctions through the University's Student Conduct Process. Please familiarize yourself with the current USP Student Handbook. In particular, adherence to the Student Conduct Policy and Academic Integrity Policy will help to ensure that your learning and living experiences are founded on integrity.

Disability Statement

Student Disability Support Services (SDSS) USP supports the educational endeavors of all students, including students with disabilities. The American's with Disabilities Act (ADA) defines a disability as a mental or physical impairment that substantially limits one or more major life activities. If you believe you have a disability that may impact your ability to fulfill your course or degree requirements, and you would like more information on applying for an accommodation, please contact the Assistant Dean of Students who serves as the SDSS Coordinator at 215-596-8950.