

Saint Louis University  
School of Public Health  
Department of Community Health  
Division of Biostatistics



**BST-500-01**

**Principles of Biostatistics**

**Fall 2006**

**Syllabus**

Monday, 9:00-11:30 am, Salus Center, Room 1501

**Instructor:**

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**Office Hours:**

By appointment on Mondays, Wednesdays,  
and Fridays

**Office Hours:**

Wednesdays, 9-11 am

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## **Objectives**

The main objectives of this course are to:

1. Introduce basic probability and distribution theory as a basis for both this course and advanced coursework in epidemiology and biostatistics.
2. Teach students descriptive and inferential statistical techniques that are important for analyzing data arising from public health research and practice.
3. Familiarize students with statistical software for conducting simple data analyses.

Specifically at the completion of this course, students should be able to:

1. Establish a statistical foundation that will be developed in advanced MPH coursework in biostatistics and epidemiology.
2. Understand and apply basic techniques in descriptive and inferential statistics including graphical and numerical descriptive statistics, elementary probability calculation, point and confidence interval estimation and hypothesis testing, simple categorical data analyses, analysis of variance, simple linear regression, and nonparametric methods.
3. Use SPSS software to conduct basic statistical analyses, including presenting descriptive statistics and conducting t-tests, chi-square tests, analysis of variance, and simple linear regression.
4. Communicate statistical analyses and results at a level appropriate to those either experienced or inexperienced in quantitative methods.

## **Course Description**

**Course Format:** Lectures and three hands-on SPSS lab sessions

**Course Elements and Requirements:**

### **Required Textbooks:**

1. Pagano M., Gauvreau K. *Principles of Biostatistics* (2<sup>nd</sup> Edition), Pacific Grove, CA: Duxbury Publishing, 2001
2. Gauvreau, K. *Student Solutions Manual for Pagano/Gauvreau's Principles of Biostatistics* (2<sup>nd</sup> Edition), Pacific Grove, CA: Duxbury Publishing, 2001

### **Recommended Textbook:**

1. Norušis, MJ. *SPSS 13.0 Guide to Data Analysis*, Upper Saddle River, NJ: Prentice Hall, 2005

SPSS tutorials are available from the following websites:

University of Texas at Austin

<http://www.utexas.edu/its/rc/tutorials/>

University of Alabama

<http://bama.ua.edu/%7Ejhartman/689/instructions.html>

### Grading:

1. Textbook assignments (15%)
2. SPSS assignments (15%)
3. Two quizzes (15%)
4. Midterm exam (25%)
5. Final exam (30%)

### Written assignments:

- Homework assignments will include nine problem sets from the Pagano/Gauvreau textbook and three SPSS exercises. **It is critical that you keep up with homework.** Failure to do so will likely result in lower exam scores.
- Assignments are weekly, due on **Mondays at 9:00 am. Late homework will not be accepted.** If you are unable to make it to class on the due date, you may either email your homework to the teaching assistant or put it in her mail slot on the 4<sup>th</sup> floor on the date the homework assignment is due.
- **Textbook problem sets:** Although we do not grade the textbook homework assignments, we collect the homework and keep records of whether you have done the assignments. However, you may be penalized for turning in assignments that are substantially incomplete. **You are only required to turn in 7 of the 9 assignments.** Solutions to most of the assigned homework problems will be included in the student solutions manual. For homework problems that are not in the solutions manual, we will either go over the answers in class or hand out an answer key on the day the assignment is due.
- **SPSS exercises:** These exercises will be graded. They are intended to give you some experience in analyzing data with statistical software and in interpreting results. **You are required to turn in all 3 of the assignments.**
- You are encouraged to discuss reading and homework assignments with other students, the instructor, or teaching assistant. However, you must turn in individual assignments.

### Quizzes and Exams:

- Two quizzes and two exams will be administered during the semester. Please consult the daily outline for the dates.
- Quizzes will last approximately 30 minutes. The mid-term exam will be an in-class exam and will take up the entire class period. The final exam will be a take-home exam distributed approximately two weeks before the due date.

***Grading Determination and Policy:***

According to The Graduate School, the only final grades allowed are: A ( $\geq 93$  to 100 points), B+ ( $\geq 90$  to 93 points), B ( $\geq 83$  to 90 points), B- ( $\geq 80$  to 83 points), C ( $\geq 73$  to 80 points) and F ( $< 73$  points).

*Attendance:* Regular class attendance is an important part of one's graduate education in public health. Students are expected to attend all scheduled class meetings. In rare circumstances (e.g., illness, accident, death in one's family), absences will be excused. However, if a student misses more than seven (7) hours of a three-credit course, they may be asked to withdraw from the course and re-take the course at a later time.

**Academic Integrity Policy**

All students enrolled in MPH Program courses are also expected to abide by and uphold Saint Louis University's Policy on Academic Integrity and Ethics. This policy is reprinted below:

The University is a community of learning, whose effectiveness requires an environment of mutual trust and integrity, such as would be expected at a Jesuit, Catholic institution. As members of this community, students, faculty, and staff members share the responsibility to maintain this environment. Academic dishonesty violates it. Although not all forms of academic dishonesty can be listed here, it can be said in general that soliciting, receiving, or providing any unauthorized assistance in the completion of any work submitted toward academic credit is dishonest. It not only violates the mutual trust necessary between faculty and students but also undermines the validity of the University's evaluation of students and takes unfair advantage of fellow students. Further, it is the responsibility of any student who observes such dishonest conduct to call it to the attention of a faculty member or administrator.

Examples of academic dishonesty would be copying from another student, copying from a book or class notes during a closed-book exam, submitting materials authored by or editorially revised by another person but presented as the student's own work, copying a passage or text directly from a published source without appropriately citing or recognizing that source, taking a test or doing an assignment or other academic work for another student, tampering with another student's work, securing or supplying in advance a copy of an examination without the knowledge or consent of the instructor, colluding with another student or students to engage in an act of academic dishonesty; and making unauthorized use of technological devices in the completion of assignments or exams.

Where there is clear indication of such dishonesty, a faculty member or administrator has the responsibility to apply appropriate sanctions. Investigations of violations will be conducted in accord with standards and procedures of the school or college through which the course or research is offered. Recommendations of sanctions to be imposed will be made to the dean of the school or college in which the student is enrolled. Possible sanctions for a violation of academic integrity include, but are not limited to, disciplinary probation, suspension, and dismissal from the University.

### **Policy on Style for Citation and Plagiarism**

The two key purposes of citation are to 1) give appropriate credit to the authors of information, research findings, and/or ideas (and avoid plagiarism) and 2) facilitate access by your readers to the sources you use in your research.

**Quotations:** When directly quoting an outside source, the borrowed text, regardless of the amount, must be surrounded by quotation marks or block quoted. Quoted text over two lines in length should be single-spaced and indented beyond the normal margins. Every quote must include a source—the author, title, volume, page numbers, etc.—whether an internal reference, footnote, or endnote is used in conjunction with a bibliography page.

**Paraphrasing or Citing an Idea:** When summarizing an outside source in your own words or citing another person’s ideas, quotation marks are not necessary, but the source must be included.

Plagiarism is a serious violation of the academic honesty policy of the School of Public Health. If a student plagiarizes others’ material or ideas, he or she may receive an “F” in the course. The faculty member may also recommend further sanctions to the Dean, per School disciplinary action policy.

Generally speaking, the three keys of acceptable citation practice are: 1) thoroughness, 2) accuracy, and 3) consistency. In other words, be sure to fully cite all sources used (thoroughness), be accurate in the citation information provided, and be consistent in the citation style you adopt. All references should include the following elements: 1) last names along with first and middle initials; 2) full title of reference; 3) name of journal or book; 4) publication city, publisher, volume, and date; and 5) page numbers referenced. When citing information from the Internet, include the WWW address at the end, with the “access date” (*i.e.*, when you obtained the information), just as you would list the document number and date for all public documents. When citing ideas or words from an individual that are not published, you can write “personal communication” along with the person’s name and date of communication. Typical formats for citing references and books can be found in *the American Journal of Public Health*.

#### **Additional Reading:**

Lathrop A, Foss K. *Student Cheating and Plagiarism in the Internet Age*. Englewood, CO: Libraries Unlimited, Inc.; 2000.  
(available to check out from Brenda McDaniel)

### **Access and Accommodation Policy**

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Office of Disabilities Services at 314-977-2930 as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

**Course Schedule**

<b>Class Dates</b>	<b>Topics</b>	<b>Readings</b>
August 28	Course Organization and Syllabus Introduction Types of numerical data Tables and graphs Measures of central tendency and dispersion	Pagano: Chapters 1-3 Norušis: Chapters 4-5
September 4	Labor Day – No class	
September 11	<i>SPSS lab session</i>	
September 18	Probability Bayes' Theorem Sensitivity and specificity	Pagano: Chapter 6
September 25	Probability distributions	Pagano: Chapter 7 Norušis: Chapter 11
October 2	<b>Quiz #1</b>	
October 9	Sampling distribution of means Confidence intervals Student's <i>t</i> distribution	Pagano: Chapter 8-9 Norušis: Chapter 12
October 16	<b>Midterm Exam</b>	
October 23	Hypothesis testing	Pagano: Chapter 10 Norušis: Chapter 12
October 30	Comparison of two means	Pagano: Chapters 11 Norušis: Chapters 13-14
November 6	Analysis of variance	Pagano: Chapter 12 Norušis: Chapter 15
November 13	<b>Quiz #2</b> <i>SPSS lab session</i>	

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November 20	Chi-square test McNemar's test Odds ratio	Pagano: Chapter 15-16 Norušis: Chapter 17
November 27	Correlation Simple linear regression	Pagano: Chapter 17-18 Norušis: Chapter 20
December 4	<i>SPSS lab session</i>	
December 11	Nonparametric methods Course review <b>Final exam due by 5 pm</b>	

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