

# Biostatistics (HS 167)

Spring 2009

Department of Health Science

San Jose State University

Website:	<a href="http://www.sjsu.edu/faculty/gerstman/hs167">www.sjsu.edu/faculty/gerstman/hs167</a> "Shortcut": <a href="http://www.sjsu.edu/biostat">www.sjsu.edu/biostat</a> > hs167 link
Description:	Statistical analysis of health and biomedical data; considers data management, exploratory and descriptive analysis (EDA), random variation and probability, statistical inference for quantitative outcomes, statistical inference for categorical outcomes. <i>Prerequisite:</i> HS 67 or equivalent, or Graduate student status.
Professor:	Bud Gerstman
Format:	In-class lectures, weekly labs, and liberal use of the Blackboard (Bb) online platform. You must check Bb at least once every 48 hours.
Lecture:	HS 167-7 (49320): Tuesdays and Thursdays from 3:00 – 4:15 in MH 324 We will end most lectures by 4:00
Labs:	Lab A: Tuesdays 4:30 - 5:45 in MH 321 Lab B: Wednesdays 12:00 – 1:15 in MH 321 Lab C: Thursdays 4:30 - 5:45 in MH 321
Communication:	<i>Email correspondence through the (Bb) email tool will be answered within 24 hours.</i> During office hours, try contacting me by phone at 408 924-2978.
Office & office hours	MH 514 See <a href="http://www.sjsu.edu/faculty/gerstman">www.sjsu.edu/faculty/gerstman</a> for current office hours.
Lab instructors	Deborah Danielewicz ( <a href="mailto:deb@mac.com">deb@mac.com</a> ) Seena Nair ( <a href="mailto:sn2006sj@gmail.com">sn2006sj@gmail.com</a> )
Prerequisites:	<b>Math competency.</b> This course requires a working knowledge of: a) the order of mathematical operations, b) fractions, c) decimals, d) powers and square roots, e) percents, f) ratios, g) formula use and operations, h) negative numbers, i) word problems, j) properties of exponents and logarithms, k) graphing, and l) basic probability. <i>Competency</i> is expected at the high school level. <b>Math requirements.</b> Undergraduates must complete the CSU Entry Level Math (ELM) requirement before entering the class. All students must take and pass the department quantitative self-test. <b>Statistics requirement.</b> Undergraduate students must complete a lower division (General Education) statistics course with a C or better sometime after Fall 2003. You are expected to come to the course knowing basic descriptive statistics (mean, standard deviation, median, quartiles, frequency, relative frequency, cumulative frequency), graphing techniques (stemplots, scatterplots), probability (rules of probability, Normal distribution characteristics and use), and inferential statistics (confidence intervals and significance tests for means using <i>t</i> procedures).

Time requirements:	Successful completion of this course requires approximately 8 hours/week × 15 weeks = 120 hours of study time. Cramming is ineffective. If you do not have adequate time to devote to this course, you are strongly encouraged to drop and then enroll at a future date.
Final Exam:	Friday December 11, 2009 1215 – 1430 in the lecture room
Text:	Gerstman, B.B. (2008). <i>Basic Biostatistics: Statistics for Public Health Practice</i> . Jones & Bartlett: Boston.
Manual:	Biostatistics Lab Manual. Available at campus store by ~8/31/09.
Calculator:	TI-30XIIS or TI81
Software:	All necessary software is installed in the College of Applied Sciences and Arts Computer Labs (MH 321 and MH332). Open lab hours for MH 332 are posted on <a href="http://www.casa.sjsu.edu/openhours.asp">http://www.casa.sjsu.edu/openhours.asp</a> . Graduate students are strongly encouraged to install SPSS (any version) and WinPEPI (public domain) on their home computers (see Lab 0).
Homework Assignments:	<i>Weekly assignments are posted on online. Late assignments will not be accepted unless a serious and compelling reason is documented by an objective source.</i>

## Academic Integrity (Office of Student Conduct & Ethical Development)

Your commitment to learning as evidenced by your enrollment at San Jose State University requires you to be honest in all academic work. **Unless explicitly stated otherwise, graded work is to be done entirely on your own.** In the past, students in this class have gone beyond permissible collaboration and have suffered serious consequences. **When anyone breaks these rules, the entire class suffers.** The belief that others are not obeying the rule erodes confidence and introduces anxieties that those who do follow the rules will be disadvantaged. Having to investigate possible cheating and plagiarism incidents takes instructor time away from helping students learn the material, and erodes confidence. Infractions will be reported to the Office of Student Conduct & Ethical Development according to policy S04-12. For additional information, see [http://www.sa.sjsu.edu/judicial\\_affairs/](http://www.sa.sjsu.edu/judicial_affairs/).

The **rules for independent work** are:

1. **Exams and quizzes** are to be done entirely on your own, without that aid of published (print or web) materials other than those expressly permitted according to the rules of the test. You may not communicate about examinations or quizzes with anyone other than a course instructor.
2. You are encouraged to collaborate freely on the completion of **labs**.
3. **Odd-numbered homework exercises** allow for collaboration.
4. **Even-numbered homework exercises** must be done on your own. If you run into a problem doing HW, you may communicate openly in lab or via the Blackboard discussion tool about the problem. The intent is to allow free and open published discussion of homework while avoiding plagiarism. In other words, we follow a scientific communication model in which sources are made clear and every individual has free access to the exchange of facts and ideas.

## Disability

If you need course adaptations or accommodations because of disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible or see me

during office hours. Presidential Directive 97-03 requires that students with disabilities register with DRC to establish a record of their disability.

## University Drop Policy

Please see the SJSU Schedule of Classes and <http://www.sjsu.edu/sac/advising/latedrops/policy/> for details about the drop procedure.

## Learning objectives

The course occurs in five modules:

1. **Data (Ch 1 & Ch 2)** —identify quantitative, ordinal, and categorical measurements; understand that the usefulness of a study is contingent on the validity its measurements; articulate the difference between surveys and comparative studies, and between experimental studies and observational comparative studies; select an SRS; randomize a treatment.
2. **Exploratory Data Analysis (Ch 3 & Ch 4)** —construct and interpret stemplots, construct and interpret frequency tables (frequency, relative frequency, cumulative frequency) and histograms; calculate and interpret means, standard deviations, medians, and quartiles (Tukey’s hinge method); draw and interpret boxplots.
3. **Probability (Ch 5, Ch 6, Ch 7)** —basic rules of probability; use *pmfs* or *pdfs* to determine probabilities (areas under the curve); calculate and interpret binomial probabilities; discuss calculate and interpret Normal probabilities and percentiles
4. **Inference for quantitative outcomes (Chapters 8 - 11)** — assess sampling distributions of statistics; calculate and interpret confidence intervals for means; test means for significance (*t* procedures); calculate and interpret power or sample size estimates when testing means
5. **Inferences for categorical outcomes (Ch 16 & Ch 17)** — calculate and interpret confidence intervals for a proportion; address inference relative risks

## Grades

Your course grade is your average HW score, midterm score, final score, and lab score. Grade cut-offs are:

100-97%	A+	89-87%	B+	79-77%	C+	69-67%	D+	Below 60%	F
96-93%	A	86-83%	B	76-73%	C	66-63%	D		
92-90%	A-	82-80%	B-	72-70%	C-	62-60%	D-		