San Jose State University
Department of Sociology and Interdisciplinary Social Sciences

SOCI 15. Statistical Applications in the Social Sciences, Fall 2014

Instructor: Saul Cohn Ph.D.
Office: DMH 237A
Telephone: 924-5338
Email: saul.cohn@sjsu.edu
Office Hours: TuTh 10:30–11:30 a.m. & Th 5:45–7:00 p.m.
Class Days/Times Section 3 TuTh 3:00–4:15 p.m.
Classrooms: Hugh Gillis Hall 122

Course Description: Introduction to statistical applications, particularly statistical inference including central tendency, a variation, the normal distributions, probability, estimation, hypothesis testing, measures of association, correlation, linear regression, and analysis of variance. Prerequisite: satisfaction of the ELM requirement. Three units.

Prerequisites: Because Soc/SS 15 meets the mathematical concepts G.E. requirement (Area B4), you must have passed the E.L.M. placement test -- or have been exempted from it -- before enrolling in the course. Instructor cannot waive this requirement. Failure to meet this prerequisite will result in University canceling your enrollment in the course and denying credit regardless of any grade earned.

GE Category: Core G.E. Area B4 Mathematical Concepts. Please note that only a C or better in the course satisfies the G.E. requirement. Grades of C-and below do not. Semester grades of C- to D- are passing and earn three units credit, but they do not satisfy the Area B4 Mathematical Concepts requirement.

Course Goals and Student Learning

The student learning and content goals for Area B4 courses include the following (1 -6)...

1. Using mathematical methods to solve quantitative problems appropriate to course content, including those presented in verbal form.
Throughout the course, we will use basic mathematical operations and a calculator to solve statistical problems. We will use many statistical formulas (which do not have to be memorized) and you should be familiar with basic algebraic operations. Test items will typically be multiple
choice, matching, short answer, and essay, including word problems. Prior to the first quiz, make sure your calculator has been "battle-tested" so you can begin solving problems on test day rather than figuring out how to work your calculator! You will need to save time in order to analyze results derived from your computations.

2. **Using mathematics to solve a real-life problems.**
Class examples and test questions will involve issues that the student is already aware of. Practice problems and tests questions will be, in most cases, derived from everyday life. Also, some data will be made up but designed to reflect true-to-life situations and contemporary events.

3. **Arriving at conclusions based upon the numerical and graphical data. This must include a familiarity with the organization, classification, and representation of quantitative data in various forms: tables, graphs, rates, percentages, and measures of central tendency and spread.**
Early coursework will look at various tables and graphs and will include rates, percentages, averages, and variation. This will be our principal focus as we start with descriptive statistics. In addition, simply following formulas and getting numerical answers are not enough, and you will be expected to demonstrate your understanding of what the numbers mean by interpreting your answers in writing.

4. **Applying mathematical concepts in one or more areas, such as analytical geometry, trigonometry, or statistical inference.**
After covering introductory concepts and procedures, the course will focus on probability and statistical inference. These concepts and methods are central to statistical analysis in the social sciences. By applying statistical inference, students will see how analytical techniques underscore many of the claims that they learn in sociology courses. For example, when sociologists teach that the poor spend a larger percentage of their income on life's necessities, they do so with confidence because other sociologists did scientific research with statistical analyses that supported that specific claim. In other words, just because people may believe it, it doesn't mean it's true, and statistical analyses help us get closer to that truth.

5. **Incorporating issues of diversity.**
Expect classroom examples and test items to frequently deal with issues of diversity. These are proper topics for university classrooms and may be particularly so for courses in the social and behavioral sciences. Expect examples which may incorporate variations or diversities of race, ethnicity, national origin, religion, sex, physical abilities, age, marital status, citizenship, economic levels, and/or sexual orientation.

6. **Writing requirements (minimum 500 words)**
You will constantly use the symbolic language of mathematics in your exercise and problem solutions. In clear and concise language, you'll be interpreting what your results mean in responding to short answer/and or essay questions on every quiz. Your writing skills are important. The thoroughness of your discussions, the clarity of your ideas, your coherence, conciseness, will be considered in evaluating this part of your work. *How* you write can be as important as what you write.
Additional Notes:
Remember that you **Do Not** need to memorize formulas. They will be made available on quiz days, but you'll have to know how to use them. Second, during tests, you may freely consult all relevant statistical tables. Finally, you will need a hand calculator. I require the **Casio FX 260** which is both powerful and simple to use. Knowing how to work your calculator can result in a half to a whole grade increase, as you are able to check your work.

Required Texts


The Casio Fx-260 is required for practice problems and quizzes. Please note that cell phones or other texting devices may not be used on quizzes or tests.

Classroom Protocol

1. **Arriving on time**
   * On-time attendance is required. Please be prompt. Occasional lateness is understood. Chronic lateness is unacceptable. If you arrive late to the classroom, please take your notebook and other materials out BEFORE entering class so as not to disturb myself or other students.

2. **In-class deportment**
   While in class, your attention is required. Please do not: answer or use cell phones, etc. All mobile access devices must be turned off. If your behavior in the classroom becomes distracting to fellow students and instructor, expect to be called upon my name and asked to desist -- the first time politely. Questions are always encouraged, some private talk between students is unavoidable, but make sure you're not becoming distracting to the classroom environment. Be mindful!!

3. **Absences: missing class**
   Even excused absences on quiz days must be documented immediately upon your return and a make up exam taken right away. Excused absences include required NCAA travel and emergencies such as personal illness, immediate family illness (pets as well), or unavoidable incidents (e.g. car accidents) while commuting to the test. Again, any such claim you make must be confirmed and documented.

Email Protocol

1. Please provide your name in each email. Emails with no names attached will not be responded to. Those with gmail accounts can easily attach a signature to all electronic correspondence.
2. **I DO NOT** discuss or give grades through email. If you want to know how you are doing, please come visit me during office hours.

3. I keep regular business hrs. I will answer emails 9-5p.m., Monday through Thursday.

**Assignments and Grading Policy**

We will start with the most basic concepts and proceed from there. Don't worry if you are not terrific at math, but you should have a basic familiarity with algebraic operations (i.e. dividing and multiplying before adding and subtracting). Questions are encouraged, and you are especially urged to keep up with the reading. You are expected to have read the material before each class session. If you ever have taken a math class before, you know that falling behind is one of the worst things you can do. The only way to lodge the material into your long-term memory bank, creating a file folder in your brain, is to study a little bit each day rather than to cram in a lot of material the night before a test. This will also ensure that you will be able to reflect on the material for further courses or at a job that requires statistical analyses. Cramming is only good for short term rather than long-term success.

The semester grade breaks down approximately as:

- **60% Quizzes**
- **Assignments 20%**
- **Final Exam 20%**

**Quizzes and Final Exam**

Most of the grade will be based on a series of five quizzes, the exact number depending on the pace we maintain as a class. Quizzes will occur at fairly regular intervals throughout the semester. Although they are labeled "quizzes", expect each one to take up at least half a class, rather than being a quickie, 10- minute exercise. Quizzes will consist of multiple choice, true and false, and problem solving. **The bulk of the points will come from problem solving, so you must know how to work the formulas.** Quizzes are open note and textbook can only be used to find areas under the curve. The lowest quiz grade will be dropped. Beyond the quizzes, while the final exam is comprehensive, it will emphasize the latter half of the course.

For the semester grade, the quiz average and the final exam percentages will be weighted and combined. As a sample grade, assume a student has a quiz average of 82 percent after dropping her lowest quiz score and a 70 percent on assignments. If she gets 85 percent on the final exam, here is her overall semester grade:

\[
(82) (.60) + (70) (.20) +(90) (.20) = 49.2 + 14+18= 81.2\% \text{ which would be a B.}
\]

**IMPORTANT: IF YOU MISS A QUIZ, THIS WILL COUNT AS YOUR LOWEST SCORE AND WILL BE DROPPED. IF YOU MISS THE FINAL, THEN YOU WILL GET A ZERO, AND 20 PERCENT TIMES 0=0. THIS ZERO ON THE FINAL EXAM WOULD BE AVERAGED IN WITH YOUR OVERALL SCORE BASED ON QUIZZES.**

Grading Scale:

- **A+ 98-100%**
- **A 91-97%**
- **A- 90%**
- **B+ 88-89%**
- **B 81-87%**
- **B- 80%**
C+  78-79%  C  71-77%  C- 70%
D+  68-69%  D  61-67%  D- 60%
F   59% or below

In order to qualify for an Incomplete, a student must have finished at least 70 percent of the semester's work with a passing grade, which is a C or better for GE classes. An incomplete is not a means of simply avoiding a low-grade and sitting through the course again. To clear the incomplete, a student may take only the missing tests, most likely the very last quiz or the final exam. Moreover, Incompletes are not given automatically. It is the student's responsibility to request an Incomplete and to make sure the necessary paperwork is filed with the department office before final exam week. One then has a calendar year to finish all work for the grade. By university policy, Incompletes not cleared within one year may revert to Fs. Students who attend class for a brief period of time, perhaps completing a couple of quizzes and then stop attending will be given a final grade based on work completed, which in most cases will be an F grade.

Note: It is the student’s responsibility to drop a class they no longer wish to attend.

Semester Schedule
Taking into account the pace at which we proceed, weekly reading assignments will be made in class. Generally, we will cover two chapters a week. Absence is not an acceptable excuse for ignorance of the course content, assignments, or quiz dates.

Below is the course outline:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Resources</th>
<th>Topics</th>
<th>Important Dates</th>
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<tbody>
<tr>
<td>1)</td>
<td>08/26-08/28</td>
<td>No reading PPTOne&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Course Introduction Statistics, variables, parameters, samples, descriptive vs. inferential statistics</td>
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<td>2)</td>
<td>09/02; 09/04</td>
<td>PPT[1] continued; PPT[2]</td>
<td>Algebraic order, summation notation, scales of measurement; Measures of Central Tendency: Mode, Median, Mean, Percentiles</td>
<td><strong>Due 09/04: Assignment 1: Ex 11</strong></td>
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<sup>1</sup> These can be found @ www.sjsu.edu/people/saul.cohn
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<thead>
<tr>
<th></th>
<th>Date</th>
<th>Content</th>
<th>Due Date</th>
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<tr>
<td>3)</td>
<td>09/09; 09/11</td>
<td>PPT[2] continued; PPT[3] Skewed Distributions extreme scores; Measures of Variability, Range, Quartiles, Inter-quartile Range, Variance, Standard Deviation, unbiased estimate;</td>
<td>Due 09/09: Assignment 2: Ex 12 Sep. 5th, Last Day to Drop Courses Without Entry on Student's Permanent Record Sep. 12th, Last Day to Add Courses Register Late</td>
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<td>4)</td>
<td>09/16; 09/18</td>
<td>PPT [4] Stem and Leaf Plots, Frequency Distributions (both ungrouped and grouped), Histograms, skewness, Bar Graphs, Pie Charts;</td>
<td>Due 09/16: Assignment 3 Ex 15 Sep. 18th Quiz #1 Wks 1-3; Cumulative</td>
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<td>5)</td>
<td>09/23; 09/25</td>
<td>PPT [5] Scatterplot, Correlation Coefficients/Pearson’s R, direct correlation, indirect correlation; coefficient of determination (ie r²)</td>
<td>Due 09/23: Assignment 4 Ex 8 Due 09/25: Assignment 5 Ex 9</td>
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<tr>
<td>6)</td>
<td>09/30; 10/02</td>
<td>PPT[6] Hypothesis Testing, Null Hypothesis, Directional vs. Non-Directional Hypothesis, Research Hypothesis</td>
<td>Due 09/30: Assignment: 6 Ex 23 10/02 Quiz #2 Wks 1-5; Cumulative</td>
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Binomial Probability Distr PDF [Download]
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<tr>
<th></th>
<th>Dates</th>
<th>Content</th>
<th>Assignments/Notes</th>
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<tr>
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<td><strong>Due 10/30: Assignment 10: Ex 54</strong></td>
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<td>10)</td>
<td>10/28;10/30</td>
<td>PPT[10] type 1 and type 2 errors; obtained vs. critical values; confidence intervals: CI for proportion;</td>
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<td>11)</td>
<td>11/04/11/06</td>
<td>PPT[10] Slides 21-23 One Sample Z Test; Standard error of mean(SEM)</td>
<td>Due 11/6: Assignment 11: Ex 18</td>
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<td>12)</td>
<td>11/11;11/13</td>
<td>11/11; Veteran’s Day</td>
<td>11/13 Quiz #4 Wks #8–10</td>
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<td>13)</td>
<td>11/18;11/20</td>
<td>PPT[11] Independent Samples t-test; critical values of t;</td>
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<td>15)</td>
<td>12/02;12/04</td>
<td>PPT[13] Nonparametric Tests, Chi Square, Chi Square Distribution; Goodness of Fit;</td>
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<td>16)</td>
<td>12/09</td>
<td>Last Day of class</td>
<td>Quiz #5 TBA</td>
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Review for Final

17) 12/15 FINAL EXAM Cumulative 12:15–14:30

Good luck in the course!

University Policies

Dropping and Adding
Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Information on add/drops are available at http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-324.html. Information about late drop is available at http://www.sjsu.edu/sac/advising/latedrops/policy/. Students should be aware of the current deadlines and penalties for adding and dropping classes.

Academic integrity
Students should know that the University’s Academic Integrity Policy is available at http://www.sa.sjsu.edu/download/judicial_affairs/Academic_Integrity_Policy_S07-2.pdf. Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University’s integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The website for Student Conduct and Ethical Development is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy F06-1 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act
If you need course adaptations or accommodations because of a disability, or if you need to make 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 requesting accommodations must register with the DRC (Disability Resource Center) to establish a record of their disability.
Campus Non-Discrimination Policy

Please be advised that I am committed to upholding the following S89-15 Policy: Non-Discrimination: In our classroom there shall be resolute and unambiguous action to eliminate discrimination on the basis of race, color, religion, national origin, sex, sexual preference, gender identity and expression, marital status, pregnancy, age, disability, or veteran status.

Learning Assistance Resource Center
The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. The center provides support services, such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. The LARC website is located at http://www.sjsu.edu/larc/.

SJSU Writing Center
The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all disciplines to become better writers. The Writing Center website is located at http://www.sjsu.edu/writingcenter/about/staff/.

Peer Mentor Center
The Peer Mentor Center is located on the 1st floor of Clark Hall in the Academic Success Center. The Peer Mentor Center is staffed with Peer Mentors who excel in helping students manage university life, tackling problems that range from academic challenges to interpersonal struggles. On the road to graduation, Peer Mentors are navigators, offering “roadside assistance” to peers who feel a bit lost or simply need help mapping out the locations of campus resources. Peer Mentor services are free and available on a drop-in basis, no reservation required. The Peer Mentor Center website is located at http://www.sjsu.edu/muse/peermentor/.