San José State University  
Department of Psychology  
Stat 245, Advanced Statistics, Section 1, Fall 2013

Contact Information

Instructor: Sean Laraway, PhD
Office Location: Dudley Moorehead Hall, Room 311
Telephone: (408) 924-5679 (I will only answer during office hours; do not leave voicemail. Use Canvas to contact me)
Email: sean.laraway@sjsu.edu (Use Canvas to contact me)
Office Hours: Wednesday, 1:30-3:30
Class Days/Time: Monday & Wednesday, 4:30-5:45 p.m.
Classroom: Dudley Moorehead Hall, Room 347
Prerequisites: Stat 95 and Stat 115 (or equivalent Elementary and Intermediate Statistics courses)

Contacting your instructor and accessing course materials

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the course Canvas page: http://sjsu.instructure.com. You are responsible for regularly checking the Canvas page to learn any updates. All class-related questions regarding assignments, exams, or other content must be posted to the “Discussions” section on Canvas. That is, I will not answer content questions that are emailed to me. This policy will ensure that all students have access to content-related answers that I provide. Before posting a question, be sure to read through the posts to make sure your question is not redundant and has already been answered. You may email the instructor through Canvas when you have personal, private questions, such as questions regarding your grade or cases of documented excuses from class. I will answer emails and Discussion posts M-Th, from 10 a.m. to 5 p.m.

Course Description

This course will cover the following topics in statistics: (a) visual analysis of data; (b) descriptive statistics; (c) hypothesis testing and confidence intervals; (d) t tests for comparing means; (e) one-, two-, and three-factor analysis of variance (ANOVA) for independent samples; (f) one- and two-factor repeated-measures ANOVA; (g) multiple comparisons tests for ANOVA and RM ANOVA; (h) power analyses and effect size measures for the analyses covered; (i) within-subject, between-subject, and mixed research designs; (j) correlation and simple
regression; (k) chi-square tests; (l) the linear model and its assumptions; and (m) nonparametric statistics.

**Course Goals and Learning Objectives**

**Course Learning Outcomes (CLO)**

Upon successful completion of this course, students will be able to:

CLO 1: Describe quantitative data in terms of center, spread, and shape; create appropriate graphical representations of these data.

CLO 2: Describe categorical data in terms of frequency and percentage; create appropriate graphical representations of these data.

CLO 3: Describe the main features of basic research designs (experimental, observational) and the conclusions that can be drawn from these designs.

CLO 4: Choose appropriate statistical analyses for different research situations.

CLO 5: Conduct and interpret inferential statistical procedures by hand and/or using computer software for quantitative and categorical data.

CLO 6: Compute various measures of effect size and strength of association.

CLO 7: Describe basic concepts in causal inference.

CLO 8: Formulate testable hypotheses and use data to test those hypotheses.

CLO 9: Use SPSS and Excel to calculate descriptive and inferential statistics.

CLO 10: Write APA-style results sections to communicate effectively the results of statistical procedures discussed in class.

**MA Experimental Goals and Program Learning Outcomes**

**GOAL 1. ADVANCED KNOWLEDGE**

PLO 1.1: Students completing the MA in Psychology program will understand the major theoretical perspectives and research methods across areas of experimental psychology, i.e., Developmental, Social, Cognitive, and Physiological.

**GOAL 2. RESEARCH METHODS & SCHOLARSHIP**

Students completing the MA in Psychology program are required to complete a thesis. The thesis will demonstrate

PLO 2.1: creative problem solving in the design, implementation of empirical research.

PLO 2.2: demonstrate project management skills in the implementation of empirical research.

PLO 2.3: demonstrate advanced competency in the statistical analysis and interpretation of empirical research findings.

PLO 2.4: be able to communicate (oral and written) their research findings at a professional level.
Stat 245 contributes to these PLOs

GOAL 3. CAREER ENHANCEMENT
PLO 3.1 Students completing the MA in Psychology program will achieve career enhancement through placement in a doctoral program or acceptance of a position requiring a master's in psychology in the public or private sector.

Stat 245 contributes to these PLOs

The learning objectives will be assessed via participation assignments, homework, exam questions, and the project. These assessment items will involve solving verbal and symbolic quantitative problems, including those that involve real-world situations.

Required Texts/Readings

Textbook (required)

Other equipment / material requirements
1. Scientific calculator (must have square root and exponent buttons)
2. Computer, printer, internet and library access
3. Scantron (882) forms
4. Access to SPSS v. 19 or higher (can be purchased at the Help Desk in Clark Hall)

Recommended equipment
A laptop or tablet is recommended, as we will have some in-class computer-based assignments. If you do not have a laptop/tablet with SPSS and Excel (or equivalent installed), you may work with a student who does.

Course Requirements and Assignments
SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week, for a total of nine hours per 3-unit course), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.
Exams
You will have four exams. Exams 1 and 2 will be taken in class. Please bring a Scantron form, pencils, and a calculator to the in-class exams. You will be allowed to use your text, notes, and a calculator during these individual exams. Exams 3 and 4 are take-home exams, although I will give you some class time to work on them. You may work alone or in teams for the take-home exams.

Final Exam
The Final Exam will be an in-class cumulative exam. You will be allowed to use your text, notes, and a calculator during this exam. You may work alone or in teams for this exam.

Participation
Additional participation assignments may involve in-class activities, take-home assignments, or other activities depending on time and other considerations. You must be present to receive credit for in-class assignments, unless you make arrangements with me.

Data Analysis Projects
You will complete four data analysis projects that will require you and your research team to analyze realistic data using computer software (e.g., SPSS, Excel) and write a concise and correct summary of the results. These reports must be typed, double-spaced, 12-point font, with 1” margins and should include at least one graph or table (software generated). Projects must use correct grammar, punctuation, and statistical style (as described in the Publication Manual of the American Psychological Association, 6th ed.; we will review some of this in class). Teams may consist of 2-3 students and all team members will earn the same grade on the project. These assignments must be uploaded to Canvas by 11:59 p.m. of the stated due date. More information and project guidelines will be given in class. Late projects will not be accepted unless you make arrangements with me.

Make-up Exams
A make-up exam will only be given if you contact me prior to missing the exam in question and/or you have a documented excuse. A cumulative make-up exam will replace one missing exam score (items will be chosen at random from previous exams). This exam will occur immediately following the Final Exam, so you should be prepared to take both.
Grading Policy

Table 1. Grading scale

<table>
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<td>100-98%</td>
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<tr>
<td>A</td>
<td>97-93%</td>
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<tr>
<td>A-</td>
<td>92-90%</td>
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<td>C+</td>
<td>79-78%</td>
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<tr>
<td>C</td>
<td>77-73%</td>
</tr>
<tr>
<td>C-</td>
<td>72-70%</td>
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<tr>
<td>D+</td>
<td>69-68%</td>
</tr>
<tr>
<td>D</td>
<td>67-63%</td>
</tr>
<tr>
<td>D-</td>
<td>62-60%</td>
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<tr>
<td>F</td>
<td>59-0%</td>
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Table 2. Assignment grade weights

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<td>25%</td>
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<td>Exams</td>
<td>4</td>
<td>15</td>
<td>60</td>
<td>60%</td>
</tr>
<tr>
<td>Projects</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Final Exam</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>15%</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>100</td>
<td>100%</td>
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</table>

Classroom Protocol

Etiquette

In an effort to create a classroom environment conducive to learning, I expect you to follow the following classroom etiquette:

1. Arrive for class on time. Arriving late disrupts other students and interferes with continuity of the lectures and class activities. If for any reason you cannot avoid being late, please enter the class through the least noticeable door and take a seat quietly. Do not come in late and enter into a conversation to catch up on information you missed or expect information you missed to be repeated. Leaving early is equally disruptive; please be considerate.
2. Be polite and respectful to other people in the class.
3. Do not carry on conversations with others during class.
4. Do not use your cell phone use for any reason. If you anticipate an emergency call, please let me know in advance.
5. Turn off all cell phones, headphones, or any other devices that produce distraction before class.
6. Do not work on any other course material during class, including studying or reading for other classes. If you do so, you will be asked to leave.
7. All professors should be addressed by his or her title (e.g., Dr. or Professor), not by “Hey” or other informal language. This is true for all classes, not just this one.

Students are expected to attend class and maintain a level of professional and courteous behavior in the classroom. Respect for the rights and opinions of others is expected. The free and open exchange of ideas is the cornerstone of
higher education, but we must always remain respectful of others, even if we disagree strongly with them. Disagreement is acceptable, but discourteousness is not. Behavior that creates a threatening or harassing environment (either online or in class) will not be tolerated. Disruptions of class activities are a violation of the Student Code of Conduct will be reported to the Office of Student Conduct and Ethical Development. In short, be cool to one another.

http://www.sjsu.edu/studentconduct/docs/Student%20Conduct%20Code%202013.pdf

Class Format
During class, we will have lectures, demonstrations, in-class activities, and question-and-answer periods. Attendance is expected and is critical for success in this course. If you miss a class, you are responsible for getting the information covered. It is vital that you complete all scheduled readings and assignments before each class. Do not talk, read non-class materials, text message, or sleep during class time. This policy will be strictly enforced. Students who fail to abide by classroom protocol may be asked to leave class.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor’s permission to record the course.

• “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
  o It is suggested that the greensheet include the instructor’s process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
  o In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
• “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Therefore, neither recording of class lectures or discussions nor distribution of course materials are allowed. Failure to follow this policy will be considered a violation of course academic integrity policy and will result in immediate expulsion from the class, a grade of F in the course,
and reporting the student to the University and proper authorities for further sanctions/punishment.

**Laptops/Tablets**

In-class laptop or tablet use should be restricted to course-related activities (e.g., taking notes, completing assignments). Other activities (e.g., checking email, playing games, accessing social media) distract both the instructor and students and will not be tolerated. You will be asked to turn off your laptop/tablet if you are engaged in non-class activities and you may be asked to refrain from further use for the duration of the course if this behavior continues.

**Cell phones and other electronic devices**

Please be certain to turn off or put in silent mode (not vibrate mode as that is still audible and is distracting) all cell phones, pagers, and any other devices that produce a distraction prior to entering the classroom. DO NOT USE YOUR PHONE FOR ANY PURPOSE DURING CLASS. You may be asked to leave for doing so. Make sure your phone is put away before class starts (place it in your pocket, purse, or book bag). You may not use any electronic device during exams except a scientific calculator. You may not use your phone as calculator during class or for exams.

**I expect you to come to class prepared**

“Prepared” means you have completed the readings and any assignments before class starts.

**Check the course Canvas site regularly**

I will make important course announcements, answer questions, and post readings on Canvas. If I become ill, I will inform you as soon as I can via Canvas. You should check the site before each class meeting.

**University Policies**

**Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s **Catalog Policies** section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the **Academic Calendars webpage** at http://www.sjsu.edu/provost/services/academic_calendars/. The **Late Drop Policy** is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the **Advising Hub** at http://www.sjsu.edu/advising/

**Academic integrity**

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The **University Academic Integrity Policy S07-2** at
http://www.sjsu.edu/senate/docs/S07-2.pdf requires 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 Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/

Instances of academic dishonesty will not be tolerated. Cheating on exams, quizzes, or projects or acts of 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 (F) in this course and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified.

**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 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.

In 2013, the Disability Resource Center changed its name to be known as the Accessible Education Center, to incorporate a philosophy of accessible education for students with disabilities. The new name change reflects the broad scope of attention and support to SJSU students with disabilities and the University's continued advocacy and commitment to increasing accessibility and inclusivity on campus.

**Student Technology Resources**

Computer labs for student use are available in the Academic Success Center at http://www.sjsu.edu/at/asc/ located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

**SJSU Peer Connections**

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they
learn to successfully navigate through their university experience. You are
couraged to take advantage of their services which include course-content
based tutoring, enhanced study and time management skills, more effective
critical thinking strategies, decision making and problem-solving abilities, and
campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of
undergraduate courses, consultation with mentors is available on a drop-in or by
appointment basis. Workshops are offered on a wide variety of topics including
preparing for the Writing Skills Test (WST), improving your learning and memory,
alleviating procrastination, surviving your first semester at SJSU, and other
related topics. A computer lab and study space are also available for student use
in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street
Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance
of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing
Building B. Visit Peer Connections website at http://peerconnections.sjsu.edufor
more information.

**SJSU Writing Center**

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing
Specialists have gone through a rigorous hiring process, and they are well
trained to assist all students at all levels within all disciplines to become better
writers. In addition to one-on-one tutoring services, the Writing Center also offers
workshops every semester on a variety of writing topics. To make an
appointment or to refer to the numerous online resources offered through the
Writing Center, visit the Writing Center website at
http://www.sjsu.edu/writingcenter. For additional resources and updated
information, follow the Writing Center on Twitter and become a fan of the SJSU
Writing Center on Facebook.
SJSU Counseling Services

The SJSU Counseling Services is located on the corner of 7th Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit Counseling Services website at http://www.sjsu.edu/counseling.

Acknowledgment

This syllabus incorporates materials developed by Dr. Ron Rogers, Dr. Susan Snycerski, Dr. Megumi Hosoda, and the SJSU Center for Faculty Development’s Accessible Syllabus Template. I have been granted permission by the authors to use these materials in whole or in part. I thank them for the use of their materials. I would also like to thank Dr. Bradley E. Huitema for his teaching and mentoring in statistics.

Note on the schedule

This course will follow this schedule to the extent possible. The timing and specific nature of topics and activities may change. You are responsible for being informed of any changes made to the class syllabus. Such changes will be clearly stated in class and will be posted on the class web site before the changes take effect.
Please note that this schedule may change with fair warning on the course Canvas site and in class.

Table 3. Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics, Readings Due</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8-21</td>
<td>Intro to Stat 245</td>
<td>Read Syllabus</td>
</tr>
<tr>
<td>2</td>
<td>8-26</td>
<td>Statistics and experimental design review, Ch. 1-2</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Displaying data, Ch. 3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9-02</td>
<td>Labor Day – No Class</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Common measures of central tendency &amp; variability, Ch. 4-5</td>
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<tr>
<td>4</td>
<td>9-09</td>
<td>The Normal Distribution and z scores, Ch. 6</td>
<td>Project 1</td>
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<tr>
<td>5</td>
<td>9-16</td>
<td>Exam 1 (Ch. 1-6)</td>
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<tr>
<td></td>
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<td>Sampling distributions, hypothesis testing, and confidence intervals, Ch. 8</td>
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<tr>
<td>6</td>
<td>9-23</td>
<td>Testing differences in means with one and two samples, Ch. 12-14</td>
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<tr>
<td>7</td>
<td>9-30</td>
<td>Power and effect size measures, Ch. 15</td>
<td>Project 2</td>
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<td>8</td>
<td>10-07</td>
<td>One-way ANOVA &amp; multiple comparisons tests, Ch. 16</td>
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<tr>
<td>9</td>
<td>10-14</td>
<td>Exam 2 (Ch. 8, 12-16)</td>
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<td>The linear model and its assumptions, Handout</td>
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<td>10</td>
<td>10-21</td>
<td>Factorial between-subjects ANOVA, 2 IVs, Ch. 17</td>
<td>Project 3</td>
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<td>10-28</td>
<td>Factorial between-subjects ANOVA, 2 and 3 IVs, Ch. 17, Handout</td>
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<td>12</td>
<td>11-04</td>
<td>Repeated Measures ANOVA, 1 and 2 IVs, Ch. 18, Handout</td>
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<td>13</td>
<td>11-11</td>
<td>Veteran’s Day – No Class</td>
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<td>11-13</td>
<td>Exam 3 (Ch. 17-18, Handout)</td>
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<td>14</td>
<td>11-18</td>
<td>Correlation &amp; simple regression, Ch. 9-10</td>
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<td>15</td>
<td>11-25</td>
<td>Chi-Square statistics, Ch. 19</td>
<td>Exam 3</td>
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<td>Week</td>
<td>Date</td>
<td>Topics, Readings Due</td>
<td>Assignments</td>
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<td>11-27</td>
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<td>Thanksgiving – NO CLASS</td>
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<td>16 12-02</td>
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<td>12-09</td>
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<td>Exam 4 (Ch. 9-10, 19)</td>
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<td>Final</td>
<td>12-13</td>
<td>2:45-5:00 p.m. (All previous material)</td>
<td>Exam 4</td>
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