San José State University  
Department of Psychology  
STAT 245: Advanced Statistics (Seminar)  
Section 1, Fall 2019

Instructor Contact Information

Instructor: Dave Schuster, Ph.D.
Office Location: DMH 315
Telephone: 408-924-5659
E-mail: david.schuster@sjsu.edu
Office Hours: Tues. & Thurs., 1:30pm – 2:00pm

Course Information

Classroom: DMH 236
Class Days/Time: Tues. & Thurs., 9:00am – 10:15am
Prerequisites: STAT 115 or equivalent

Course Description

This seminar prepares students to select, use, interpret, and communicate the results of statistical analysis in social science research. Topics we will cover include: fundamental principles of statistical inference, hypothesis testing, graphical analysis of data; descriptive statistics, t-tests, and ANOVA. We will focus on advanced topics related to the general linear model (GLM) such as: factorial ANOVA, repeated-measures ANOVA, simple effects tests, power, effect size, and statistical conclusion validity.

From the catalog: Advanced problems in statistical analysis. Advanced consideration of hypothesis testing, estimation and analysis of variance.

Course Format

This is a technology intensive seminar. Required technology is described below.

Learning Outcomes

Program Learning Outcomes

Upon successful completion of the requirements for the MA in Research and Experimental Psychology, students will be able to:
Goal 1. Knowledge Base – 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.

- PLO 1.1 – 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 – Graduates of our program will possess an advanced level of competence in research methods, statistical techniques, and technical writing skills. Students completing the MA in Psychology program are required to complete a thesis. The thesis will:

- *PLO 2.1 – demonstrate 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.

Goal 3. Career Enhancement – Graduates of our program will experience 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. Students completing the MA in Psychology program will:

- PLO 3.1 – 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 PLOs 2.1, 2.3, and 2.4.

Course Learning Outcomes
The goals of this course are to help you: build a solid conceptual understanding of statistics in research, develop the practical skills to use statistics in your own research, and become a self-directed learner.

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

- CLO 1 – Define statistical procedures, including those associated with: data cleaning, descriptive statistics, t-tests, ANOVA, and multiple regression.
- CLO 2 – Describe which statistical procedures are appropriate for a given research situation
- CLO 3 – Discuss the underlying requirements and assumptions of statistical procedures
- CLO 4 – Conduct and interpret statistical analysis using computer software
- CLO 5 – Communicate results of statistical analysis in APA style

The learning objectives will be assessed via written assignments and exam questions. The course learning objectives were adapted from those of Dr. Sean Laraway and Dr. Howard Tokunaga.

Required Materials

Canvas and E-Mail
Unless otherwise announced in class, all graded assignments will be accepted only in electronic form using the Canvas learning management system assignments page (Canvas is available at https://sjsu.instructure.com/). Having access to the Internet is your responsibility, so have backup plans in
case you have problems with your primary computer. I cannot accept excuses about technology problems as valid, unless the entire University network or all of Canvas is offline.

Supplementary course material will be made available on Canvas regularly. Communication regarding the course will be sent via the e-mail address linked to your MySJSU account or posted to Canvas. It is your responsibility to make sure you are enrolled in Canvas and receiving my e-mails.

**Required Texts/Readings**


An electronic edition is available for rental or purchase from [http://www.vitalsource.com](http://www.vitalsource.com). Additional Readings will be made available on the Canvas site.

**SPSS and Microsoft Excel**

Many assignments will require you to perform analysis in and outside of class using SPSS and Microsoft Excel.

To use SPSS, it is intended that you obtain a copy of SPSS for your own computer using the SJSU site license at no cost. Instructions to download, install, and license SPSS are available on the [software downloads](http://www.sjsu.edu/it/services/collaboration/software/instructions.php) web site.

SJSU’s license for Microsoft Office allows you a free subscription to Office 365, which includes a download of Excel. Visit the [eligibility web site](http://www.office.com/getoffice365) at [http://www.office.com/getoffice365](http://www.office.com/getoffice365).

**Laptop (optional)**

You are welcome to bring a laptop or tablet computer to class, but one is not required. Mobile computers can only be used during class for course-related work.

**Grading Policy**

**Determination of Grades**

Grades will be available to you on Canvas throughout the semester. Grades are assigned based on your final point total out of 1000 points for the course:

- **A+** > 965 points
- **A** 916 to 965 points
- **A-** 896 to 915 points
- **B+** 866 to 895 points
- **B** 816 to 865 points
<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
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<tbody>
<tr>
<td>B-</td>
<td>796 to 815</td>
</tr>
<tr>
<td>C+</td>
<td>766 to 795</td>
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<tr>
<td>C</td>
<td>716 to 765</td>
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<tr>
<td>C-</td>
<td>696 to 715</td>
</tr>
<tr>
<td>D+</td>
<td>666 to 695</td>
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<tr>
<td>D</td>
<td>616 to 665</td>
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<tr>
<td>D-</td>
<td>595 to 615</td>
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<td>F</td>
<td>&lt; 595</td>
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</table>

**Rounding is Included in the Grading Scale**

The point totals reflect rounding up to the nearest percentage. For example, an A- would normally require 900 points (or 90% of 1000 points). With rounding, it only requires 896 points (or 89.6% of 1000 points). Because rounding is built into the grading scale, your grade will be based on your final point total, rounded to the nearest whole point (so, 895.6 points is an A-, but 895.4 points is a B+). To be fair to everyone in the class, these are firm cutoffs.

**Make-Up and Extension Policy**

Make-ups or extensions for any graded assignment will only be given when:

- The reason is exceptional, unforeseen, and unavoidable. Examples of exceptional circumstances are health emergencies, religious obligations, and military service. Work scheduling is not a sufficient reason for a make-up or extension.
- You provide written documentation.
- You notify me immediately after you become aware of the circumstances requiring a make-up or extension by filling out this request form at [http://goo.gl/forms/0yJQ2KbvtP](http://goo.gl/forms/0yJQ2KbvtP).

If the need for a make-up is known before the assignment due date, the assignment must be completed early. Do not e-mail me with requests for a make-up or extension; instead, complete the request form.

**Course Requirements and Assignments**

**Exams**

Exams are 60% of your final grade (600 points total).

Three exams are worth 200 points each for a total of 600 points. Exams will focus on applying the knowledge learned in the previous part of the course. The third exam is a cumulative final exam.

You may bring and refer to your own notes and the required textbooks during exams. You will be allowed to use SPSS, Excel, and a calculator on the computer at your lab workstation, but Internet access will not be allowed. Digital notes can be loaded onto the computer before the start of the exam, but all media must be ejected from the computer before starting the exam and all Internet applications closed. All other assistance is prohibited. If you will need to refer to any digital materials, you will need to print them out ahead of time. If you have any questions about what material is allowed, ask me.
**Final Examination or Evaluation**
The third exam is a cumulative final exam in the format described above.

**Portfolio Assignments**
*Portfolio assignments are 40% of your final grade (400 points total).*

A portion of our weekly class meetings will be devoted to collaborative activity questions presented in class. You will collect and refine your responses to these activity questions in a portfolio to be submitted by the start of class as described in the schedule. You must be present and work on the portfolio questions in class in order to get credit for them. Three portfolio assignments will be worth 133.33 points each for a total of 400 points. All assignments must be submitted through Canvas. Without an extension, portfolio assignments submitted late, even by a few minutes, will be accepted with a 25% late point deduction within 24 hours of the due date. Assignments submitted more than 24 hours after the due date will not be accepted for credit.

**Classroom Protocol**
In the graduate seminar format, professional behavior is an expectation. This includes the usual: come prepared to class, arrive on time, silence your electronics, be polite and respectful to everyone in the room, do not do off-topic activities during class, and speak up when you are confused, have questions, or need help.

As this is a graduate class, attending class implies your willingness to behave in a professional manner. Respectful disagreement and debate are encouraged. However, unprofessional, disrespectful, or disruptive behavior is a violation of the Student Code of Conduct, available at [http://www.sjsu.edu/studentconduct/docs/Student%20Conduct%20Code%202013.pdf](http://www.sjsu.edu/studentconduct/docs/Student%20Conduct%20Code%202013.pdf). Such behavior may result in being asked to leave the class and/or referrals to the Office of Student Conduct and Ethical Development.

**University Policies**
Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf), university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs’ Syllabus Information web page at [http://www.sjsu.edu/gup/syllabusinfo/](http://www.sjsu.edu/gup/syllabusinfo/). Make sure to visit this page, review and be familiar with these university policies and resources.

You must obtain the instructor’s permission to make any audio or video recordings in this class.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

**Academic Integrity**
Please don’t cheat. I will not tolerate academic dishonesty in my courses. You can expect me to follow all University policies and protocols regarding the handling of suspected academic dishonesty. Penalties may include expulsion from SJSU. Software and statistical analysis may be used to detect academic dishonesty. All materials used during an exam are subject to inspection.
About Diversity

Consistent with the mission of San José State University, I welcome persons of differing backgrounds and experiences including, but not limited to, age, disability and health status, ethnicity and race, family structure, geographic region, language, religious/spiritual and secular beliefs, resident status, sex, sexual orientation, gender identity/expression, and socioeconomic status.

It is my goal to foster an environment in which diversity is recognized and embraced, and every person is treated with dignity, respect, and justice. I hope that your academic experience in this course and at San José State University will provide the opportunity to gain knowledge and experiences necessary to thrive in a diverse, global environment.

Course Schedule

The course schedule is tentative and likely to change; modifications will be posted to Canvas.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments due by class start time on Tuesday</th>
<th>Reading supplemental readings discussed on Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thu., Aug. 22</td>
<td>Introduction</td>
<td></td>
<td>Statistics Review Packet; Cohen Ch. 1</td>
</tr>
<tr>
<td>2</td>
<td>Tue., Aug. 27 Thu., Aug. 29</td>
<td>Technology for statistical analysis</td>
<td></td>
<td>Pallant Ch. 3, 7, 8; Velleman &amp; Wilkinson, 1993</td>
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<tr>
<td>3</td>
<td>Tue., Sep. 3 Thu., Sep. 5</td>
<td>Descriptive statistics</td>
<td></td>
<td>Cohen Ch. 3; Pallant Ch. 6; Cohen, 1990</td>
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<tr>
<td>4</td>
<td>Tue., Sep. 10 Thu., Sep. 12</td>
<td>Inferential statistics</td>
<td></td>
<td>Pallant Ch. 10</td>
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<tr>
<td>5</td>
<td>Tue., Sep. 17 Thu., Sep. 19</td>
<td>Exam review (Tue.; tentative) Exam 1 (Thu.)</td>
<td>Portfolio 1</td>
<td></td>
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<tr>
<td>6</td>
<td>Tue., Sep. 24 Thu., Sep. 26</td>
<td>Data cleaning and missing values analysis</td>
<td></td>
<td>Pallant Ch. 4, 5</td>
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<tr>
<td>7</td>
<td>Tue., Oct. 1 Thu., Oct. 3</td>
<td>Theoretical and practical issues in hypothesis testing</td>
<td></td>
<td>Nuzzo, 2014; Cohen Ch. 4 &amp; 5</td>
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<tr>
<td>8</td>
<td>Tue., Oct. 8 Thu., Oct. 10</td>
<td>Statistical power and effect size</td>
<td></td>
<td>Science, 2015; Maxwell, Lau, &amp; Howard, 2015; Cohen Ch. 8</td>
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<tr>
<td>Week</td>
<td>Date</td>
<td>Topic</td>
<td>Assignments due by class start time on Tuesday</td>
<td>Reading supplemental readings discussed on Thursday</td>
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<td>9</td>
<td>Tue., Oct. 15</td>
<td>One- and two-sample hypothesis tests</td>
<td></td>
<td>Cohen Ch. 6, 7, 11; Pallant Ch. 17</td>
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<td></td>
<td>Thu., Oct. 17</td>
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<tr>
<td>10</td>
<td>Tue., Oct. 22</td>
<td>Correlation, regression, and the general linear model (GLM)</td>
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<td>Cohen Ch. 17; Pallant Ch. 13</td>
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<td>Thu., Oct. 24</td>
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<td>11</td>
<td>Tue., Oct. 29</td>
<td>Exam Review – <strong>No class Exam 2</strong> (Thu.)</td>
<td>Portfolio 2</td>
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<td>Thu., Oct. 31</td>
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<td>12</td>
<td>Tue., Nov. 5</td>
<td>One-way ANOVA</td>
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<td>Cohen Ch. 12 &amp; 15; Pallant Ch. 18</td>
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<td>Thu., Nov. 7</td>
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<td>13</td>
<td>Tue., Nov. 12</td>
<td>Multiple comparisons</td>
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<td>Cohen Ch. 13</td>
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<td>Thu., Nov. 14</td>
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<td>14</td>
<td>Tue., Nov. 19</td>
<td>Factorial ANOVA</td>
<td></td>
<td>Cohen Ch. 14 &amp; 16; Pallant Ch. 19 &amp; 20</td>
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<td>Thu., Nov. 21</td>
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<tr>
<td>15</td>
<td>Tue., Nov. 26</td>
<td>Factorial ANOVA</td>
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<td>Cohen Ch. 18</td>
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<td>Thu., Nov. 28</td>
<td>Thanksgiving, <strong>No class</strong> (Thu.)</td>
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<td>16</td>
<td>Tue., Dec. 3</td>
<td>Factorial ANOVA</td>
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<td>Thu., Dec. 5</td>
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<td>Final</td>
<td>Mon., Dec. 16</td>
<td><strong>Exam 3: 7:15am - 9:30am</strong></td>
<td>Portfolio 3 due by final</td>
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