



## PSYC 5340: Advanced Statistics and Design

- **Term:** Fall 2024
- **Section:** PSYC 5340.001
- **Meeting Times:** Wednesdays 11:00AM to 1:45PM
- **Location:** WT Brookshire Hall 00137
- **Instructor:** Samantha Estrada PhD
- **Email:** sestrada@uttyler.edu

### Office Hours

- **What are office hours?** These are times where I will be in my (virtual) office and you can come and ask me anything class related.
- **Office hours:** Tuesday/Thursday 5-6PM via Zoom (usually I will be in WT 136 after class). Link in Canvas. Wednesdays 2-3PM BEP 254
- You can find the Zoom link and passcode in the homepage of **Canvas**.

### Required Texts

- Navarro, D.J. & Foxcroft, D. R. (2019). Learning Statistics with jamovi: A Tutorial for Psychology Students and other Beginners. (Version 0.70). DOI: 10.24384/hgc3-7p15 You can download it here: <https://www.learnstatswithjamovi.com/>
- Publication Manual of the American Psychological Association (7th Ed.).(2020).Washington, DC: American Psychological Association.

### Files

The files for this course will work best with Google Chrome. Make sure you that before you email the TAs or me you have attempted to open the files in a different browser. In recent semesters, Safari has been the most troublesome browser.

### Required Software

- We will be using a free and open-source software for our data projects called **jamovi**. You can download the software here: <https://www.jamovi.org/> and you can watch a tutorial installation here: <https://www.youtube.com/watch?v=syx0f4xCxpk>
- We will also use the free and open-source software **G\*Power** which can be downloaded here: <https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower.html>
- Both **jamovi** and **G\*Power** are available on the virtual desktop.

**Why not SPSS?** Mainly because my objective is to provide a quality course where the content is free and accessible to everyone. SPSS is not a free software, a student license is around > \$180. And this price will only go up once you graduate. Students often tell me that “everyone is using SPSS in their field” this is not true. Please read these two blog posts as to why SPSS is on decline <https://lindeloev.net/spss-is-dying/> and <http://r4stats.com/articles/popularity/>. Know that **jamovi** is a user-friendly version of R which is now becoming the most popular statistical software.

**Course Catalog Description:** Includes aspects of complex experimental designs, statistical hypothesis testing, decision theory, multiple regression analysis, ANOVA, distribution-free techniques, and factor analysis.

**Required Prerequisites:** PSYC 2354 and PSYC 2331 (or equivalent undergraduate statistics and research methods courses at another institution) and consent of instructor.

**Student Learning Outcomes:** As a result of this course, successful students will be able to:

- Identify and articulate the theoretical underpinnings of inferential statistics and experimental design.
- Articulate basic principles of statistical analyses, including measures of central tendency, variability, sampling distributions and hypothesis testing.
- Accurately choose and conduct statistical data analyses, using *jamovi* statistical software, emphasizing the basic assumptions, appropriate uses, and the interpretation of each.
- Employ qualitative, quantitative, and single-case research methods.

**Course Format** You must have access to a computer or a laptop. The class will be a combination of lecture and practical application. The first half of the class will consist of lecture followed by a short break. The second part of class will consist of practical application.

## CEP Mission

The mission of the CEP is to prepare competent and passionate professionals in the fields of education, psychology, and counseling; to advance knowledge and expertise; and to impact these fields locally, regionally, nationally, and internationally.

## CEP Vision

The CEP will be a global leader in responding to needs in the fields of education, psychology, and counseling, with a focus on the East Texas region, by creating innovative academic and scholarly pathways and partnerships.

## Data Projects

- There will be a data assignment (roughly) for each of the topics we cover. The due date for these assignments will be Wednesdays 11:59 PM for the week each topic is covered.
- Students are responsible for making sure their online submissions have been appropriately submitted. If a student submits an incorrect file they will receive a grade of zero.
- Label your assignments as: `LastNamePartner1.LastNamePartner2.AssignmentName.pdf`.
- All assignments **MUST** be turned in on time to receive full credit.
- You will get to drop 2 assignments no questions asked without it affecting your grade.
- Data Projects will be completed individually. If you choose to have a partner you need to submit two files:
  - 1) PDF with final submission with no track changes (used for grading).
  - 2) Word document (or PDF) with track changes. showing both partners are working on the assignment. There will be a 5 point deduction if this file is missing. The partnership will be dissolved if there is no collaboration in track changes.

## Participation

There will be four to six participation activities throughout the course. There will be no make-ups for these activities, though you get to drop ONE of these without it affecting your grade. These will mostly consist

of worksheets (EFA, Non Parametric), quick data projects (variable recoding, replication of open science), IRB and jigsaw activities. Each of these will be worth 10 points.

## Jigsaw Activity

A jigsaw activity is a cooperative learning technique where students work in groups to teach each other something. There will be 4-5 articles related to ethics in statistics and research design available in Canvas.

- Each student will sign up for 1 article.
- Students will gather in a group and teach each other about their selected article.
- Submit a 1 page handout.
  - This handout needs to be submitted in Canvas.
  - This handout needs to contain the reference of the article in APA Style.
  - You can share this handout with your classmates on paper/digital form.
  - You can find an example handout in Canvas.

## Exams

This class will have a midterm exam and a final project.

### Midterm

You will have the following midterm activities:

- A data project utilizing applied concepts using **jamovi** to replicate a published study.
- You will analyze data from an open source journal and replicate a published study analysis.
- Perform a sensitivity (or power analysis)
- Report your statistical analyses findings in APA Style.
- A quiz.

### Final Project

In a group of your choosing, you will work to design and test a hypothesis using one of the provided real data sets posted on Canvas. The final product will consist of a detailed poster/infographic and paper. Part of this final project will consist of:

- Complete a poster or infographic.
- Publishable quality report
- You will participate in a peer review of the literature review for this project.
- You will grade other team members on their level of participation and engagement with the project.
- More information in Canvas.

### Non-optional meeting with Dr. Estrada

- In order to be able to “course correct” you should schedule a meeting with me via **calendly** if you:
  - Score below 70 on a midterm.
  - Miss two or more data projects or score low (< 6 pts) in multiple data projects.

## Grading

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Midterm	20%
Final Data Project	20%
Homework Data Projects	40%

Participation	20%
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## Grading Scale

90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
0 - 59%	F

## Email Netiquette

- I will respond to emails Monday to Friday from 8-5 pm.
- Make sure your question isn't addressed in this syllabus.
- When you email me, identify what course you are in. State what section, day, and time you are in. I teach more than one statistics class, and more than one section every day.
- Address me as Dr. Estrada. Do not begin your email with "hey." I'm also not Ms. Estrada.

## FAQ

- The student could answer their own inquiry by reading the syllabus.
- Do not email me inquiring about your final grade or to help you predict your final grade.
- Grades will be available on Canvas and you should know what you need to pass the course.
- The student should use his/hers UTT email at all times. Do not email me from your private account (eg. coolguy23@gmail.com). If you email me from a personal email, I will NOT respond.
- The student missed class for which there was no exam. I do not need to know the exact reason for a missed class. Students with excusable absences are responsible for giving me a note in hard copy that documents the reason for the missed class. An e-mail is unnecessary unless the impromptu absence involved missing a midterm or final.
- The student wants to know what topics they missed during a class they skipped. The answer is always "you missed what was on the syllabus."
- The students wants to know how many classes they missed at some point during the semester. I assume the student has a better answer to that question than me until the end
- The student is requesting an extension on an assignment for which the syllabus already established the deadline. The answer is always "no".
- The student is "grade grubbing" or asking to round up a grade. The answer is always "no".
- The student is asking for an extra credit opportunity. PSYC 5340 is a master's level course there is no extra credit.

## When to contact the Teaching Assistant (TA):

- TAs change semester by semester. To find their information more accurately you can look in the homepage of our class Canvas.
- For question regarding discussion board grades.
- Questions regarding tutoring or review sessions.

**Make-up exams and assignments:** To be eligible for a make-up exam or assignment that was missed due to an absence, you will have to bring in some kind of official documentation for that absence (doctor note, work note, etc). This same policy applies to late work. The only late assignments accepted will have appropriate documentation. You are not to submit a late assignment without first providing documentation (remember you can drop 2 assignment without it affecting your grade).

**Incompletes** A grade of I (Incomplete), will only be given provided the student has a grade of C or better in the course.

**Late Policy** In general, I have a 20% deduction for every day an assignment in the **Homework Data Projects** category is late and once an assignment is late it will receive minimum feedback. After five days it's an automatic zero. Assignments in the **Participation** category will not be accepted late. No feedback will be provided for late assignments.

## Tentative Schedule & Topics

### Week 01, 08/28: Data Entry & Importing Data, Graphs

**Textbook:** Navarro & Foxcroft (2019) Chapter 3 (pgs.43 – 55): Getting started with jamovi.

**Textbook:** Navarro & Foxcroft (2019) Chapter 5 (pgs.85 – 96): Drawing Graphs.

\* **Quiz** Syllabus & Introduction to jamovi. \* jamovi installation. \* **G\*Power** installation.

### Week 02, 09/04: Descriptive Statistics, Recoding and Computing Variables

**Textbook:** Navarro & Foxcroft (2019) Chapter 4 (pgs.59 – 84): Descriptive Statistics.

**Textbook:** Navarro & Foxcroft (2019) Chapter 6 (pgs.97 – 117): Pragmatic Matters.

**Data Project:** Data Entry & Graphs. due Wednesday, 09/04 at 11:59 pm

### Week 03, 09/11: Hypothesis Testing & Chi-Square Tests

**Reading:** Nimon (2012). **Reading:** Chapter 9 (pgs. 181-206): Hypothesis Testing. **Textbook:** Navarro & Foxcroft (2019) Chapter 10 (pgs. 211 – 239): Categorical Data Analysis.

- The  $\chi^2$  goodness-of-fit test.
- The  $\chi^2$  test of independence.
- Effect Size.
- Assumptions of the test(s).

**Data Project:** Data Management & Descriptives due Wednesday, 09/11 at 11:59 pm.

**Final Data Project:** Exchange contact information with your team.

### Week 04, 09/18: Comparing Two Means

**Data Project:** Chi-square Tests due Wednesday, 09/18 at 11:59 pm.

**Final Data Project:** As a team begin perusing the available datasets in Canvas.

**Jigsaw #1 Ethics Textbook:** Navarro & Foxcroft (2019) Chapter 11 (pgs.241 – 280): Comparing Two Means.

- Independent Samples t-test (Student test).
- Paired-samples t-test.
- Effect size.

### Week 05, 09/25: Correlation and Linear Regression

**Data Project:** Comparing Two Means due Wednesday, 09/25 at 11:59 pm.

**Final Data Project:** Variables and Dataset Activity.

**Textbook:** Navarro & Foxcroft (2019) Chapter 12: Correlation and Regression.

### **Week 06, 10/02: Hierarchical Regression**

**Textbook:** Navarro & Foxcroft (2019) Chapter 12: Correlation and Regression.

**Reading:** Petrocelli (2003).

### **Week 07, 10/09: Logistic Regression**

**Data Project:** Hierarchical Regression due Wednesday, 10/09 at 11:59 pm.

**Reading:** Stoltzfus (2011).

**Draft of Literature Review, Hypotheses and Research Question(s).** DUE at 11:59 PM on 10/15

### **Week 08, 10/16: Midterm Project.**

- The written portion exam will open due Wednesday, 10/09 and close due Wednesday, 10/16.
- The quiz will open due Wednesday, 10/16 and close due Wednesday, 10/23

### **Week 09, 10/23: One Way ANOVA & Factorial ANOVA**

**Data Project:** Logistic Regression due Wednesday, 10/23 at 11:59 pm.

**Peer Review:** Each member should bring a paper copy of the literature review draft to complete peer review in-class.

**Textbook:** Navarro & Foxcroft (2019) Chapter 13 (pgs.327 – 360): Comparing several means (One-Way ANOVA).

**Textbook:** Navarro & Foxcroft (2019) Chapter 14 (pgs. 361– 417): Factorial ANOVA.

- Factorial ANOVA 1: balanced designs, no interactions.
- Effect Size.
- Assumption checking.

### **Week 10, 10/30: Exploratory Factor Analysis and Reliability**

**Data Project:** ANOVA due Wednesday, 10/30 at 11:59 pm.

**Textbook:** Navarro & Foxcroft (2019) Chapter 15 (pgs.419 – 464): Exploratory Factor Analysis.

**DRAFT** Methods section. No peer review needed for this draft.

### **Week 11, 11/06: Survey Research and Reliability**

**Reading:** Huck (2012) Reliability and Validity chapter.

**Textbook:** Navarro & Foxcroft (2019) pp. 22 and 459.

### **Week 12, 11/13: MANOVA**

**Data Project:** EFA due Wednesday, 11/13 at 11:59 pm.

**Textbook:** Chapter 13 (pgs.327 – 360): Comparing several means (One-Way ANOVA).

### **Week 13, 11/20: Non Parametric**

**Jigsaw #2:** Ethics & Research

**Data Project:** MANOVA due Wednesday, 11/13 at 11:59 pm

### **Week 14, 11/27: Turkey Break NO CLASS**

### **Week 15, 12/04: Final Data Project**

**Discussion Board:** Poster & 5 minute poster presentation.

## Week 16, 12/11: Final Data Project

**Discussion Board:** Feedback to classmates.

Paper submission. DUE due Wednesday, 12/11 at 11:59 pm.

Peer Evaluation. DUE due Wednesday, 12/11 at 11:59 pm.

## University Policies

- UT Tyler Policies: <https://www.uttyler.edu/links/>
- UT Tyler COVID-19 Information and Procedures: <https://www.uttyler.edu/coronavirus/>
- UT Tyler Technology Support: <https://www.uttyler.edu/it/support/student-support.php>
- Disability Services: <http://www.uttyler.edu/disabilityservices>.
- UT Tyler Writing Center (903.565.5995), [writingcenter@uttyler.edu](mailto:writingcenter@uttyler.edu)
- UT Tyler Tutoring Center (903.565.5964), [tutoring@uttyler.edu](mailto:tutoring@uttyler.edu)
- UT Tyler Counseling Center (903.566.7254)
- The Robert R. Muntz Library: <http://www.uttyler.edu/library/>

*I RESERVE THE RIGHT TO MODIFY THIS SYLLABUS AT ANY TIME. THEREFORE, YOUR ATTENDANCE AND ATTENTION TO THE ANNOUNCEMENTS IN CANVAS ARE CRUCIAL BECAUSE IT WILL ASSIST YOU REMAIN CURRENT ON THE MATERIAL AND KNOW WHEN THE SYLLABUS MAY BE MODIFIED.*

## Readings

*Note:* All these readings are available in Canvas in PDF form.

Huck, S. (2012). *Reading statistics and research*. Boston, MA: Pearson Education.

Navarro, D., & Foxcroft, D. (2019). *Learning statistics with jamovi: A tutorial for psychology students and other beginners (version 0.70)*.

Nimon, K. F. (2012). Statistical assumptions of substantive analyses across the general linear model: A mini-review. *Frontiers in Psychology, 3*, 322.

Petrocelli, J. V. (2003). Hierarchical multiple regression in counseling research: Common problems and possible remedies. *Measurement and Evaluation in Counseling and Development, 36*(1), 9-22.

Stoltzfus, J. C. (2011). Logistic regression: A brief primer. *Academic Emergency Medicine, 18*(10), 1099-1104.