



SAINT LOUIS  
UNIVERSITY.

**Spring 2022**

**Saint Louis University**

**School of Education**

**EDR 6060-01: Research Design and Analysis (3 credits)**

**Thursdays 4:15 PM—7:00 PM**

**Fitzgerald Hall 225**

**Instructor:** Jonathan Turk, Ph.D.(he/him/his)  
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School of Education  
Fitzgerald Hall, Room 112

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**Instructor Website:** [www.jonathanturk.com](http://www.jonathanturk.com)

**Office Hours:** MW: 11:00-12:00; TR: 3:00-4:00; or by appointment

### **Catalog Course Description**

This course provides continued exploration of basic quantitative research designs and statistical methods used in educational research with an emphasis on their implementation using statistical software. Methods covered include descriptive analysis, comparison of means, analysis of variance, correlation, and regression.

### **Prerequisites**

EDR 5000: General Research Methods for Education or equivalent; and  
EDR 5100: Introduction to Inferential Statistics or equivalent

### **Course Outcomes**

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

- Understand and differentiate between descriptive, correlational/inferential, quasi-experimental, and experimental research designs.
- Write clear research questions, informed by the literature, that can be answered using quantitative research methods.
- Construct and clean datasets using Microsoft Excel and *Stata* statistical software.
- Appropriately choose and conduct descriptive analysis, t-tests, one-way and two-way ANOVA, correlation, chi-square, multiple regression, and logistic regression using *Stata* syntax.
- Check assumptions and run diagnostics for basic statistical methods using *Stata*.
- Interpret statistical output and write-up statistical findings adhering to APA 7<sup>th</sup> and professional standards.
- Develop and write a quantitative research proposal/mini study.

### Required Text

Weinberg, S. L., & Abramowitz, S. K. (2020). *Statistics using Stata: An integrative approach* (2<sup>nd</sup> ed.). Cambridge University Press.

### Required Software

While any edition of *Stata* beyond *Stata 11* will suffice, I would strongly encourage those without a current license to purchase *Stata 17*. Please note that multiple license options exist, however the cheapest option for students is a 6-month license of *Stata 17 B/E* for \$48: <https://www.stata.com/order/new/edu/profplus/student-pricing/>. If you are intending to purchase a license for a period longer than 6-months, please chat with me first so I can help you select the best version of *Stata* for your needs. You will need to bring a laptop with *Stata* installed to all class sessions beginning Week 4

### A Note from Your Instructor

This course is intended to largely be a continuation of *EDR 5100 Introduction to Inferential Statistics for Education* but with a greater focus on the implementation of basic statistical methods using statistical software. Methods that will be covered include descriptive analysis, t-tests, one-way and two-way ANOVA, chi-square, correlation and simple regression, multiple regression, and logistic regression. In this class, we will focus primarily on the steps needed to prepare data for analysis, developing syntax to execute statistical methods, and the interpretation and write-up of results including diagnostic results. We will spend the first couple of weeks reviewing basic quantitative research designs as well as how to identify researchable problems, review the literature, and draft research questions.

*Stata 17* will be the exclusive statistical software used in this class. While each software program has its own strengths and limitations, *Stata* is a robust and economical tool that possess many strengths. In addition to the course textbook, all students will be required to purchase a copy of *Stata* for use in this class. With that, please note that no prior knowledge of *Stata* is required to be successful in this course.

Students wishing to advance their quantitative training beyond basic methods are strongly encouraged to enroll in *EDR 6100 Intermediate Applied Statistics for Education*. *EDR 6100* primarily covers linear regression with a greater focus on understanding the mathematics undergirding the method. While we will have units focusing on regression in this class, we will not have time to go as in-depth as is possible (and really necessary) in *EDR 6100*.

Finally, please know that I am excited to be working with you this semester! One of the best parts of my job is working with graduate colleagues and I am particularly passionate about teaching methods. I know that learning statistical methods and new software can be intimidating. You will also likely struggle at times. My main advice is not to get discouraged. I've been at this for over 10 years and still run into roadblocks, error messages, and the occasional confusion around how to interpret this number or that number. The not so secret, secret is that all quantitative researchers do (no matter how long they have been doing it). As we move through the semester, please do not hesitate

to ask questions in class, stop by my office hours, or even look to our friends Google and YouTube when you find yourself stuck. I am looking forward to engaging classes, learning more about your research interests, expertise and goals, and facilitating an environment where we can all learn from one another.

## **Assignments & Grading**

### **Participation (15%)**

All students are expected to engage actively, thoughtfully, and respectfully in each class session. This includes coming to class having completed all assigned readings, contributing to class discussions, and participating in in-class activities. This is a hands-on course. We will regularly spend 50% or more of each class session working through problem sets and examples together.

### **Homework (50%)**

Throughout out the term, you will be required to complete short homework assignments that will allow you to practice cleaning data, applying statistical techniques in *Stata*, creating tables and figures, and writing up your findings. For each assignment, you will be required to submit you *Stata* .do file and your write up. Most write-ups will be under five pages (double-spaced and inclusive of tables/figures). I will provide the datasets needed to complete the assignments on Canvas

	<b>Due Date</b>	<b>Topic</b>	<b>Value</b>
Homework 1	Feb. 17 <sup>th</sup>	Data Cleaning	5%
Homework 2	Feb. 24 <sup>th</sup>	Descriptive Analysis	5%
Homework 3	March 3 <sup>rd</sup>	T-Test	10%
Homework 4	March 10 <sup>th</sup>	One-Way ANOVA	10%
Homework 5	March 31 <sup>st</sup>	Correlation & Simple Linear Regression	10%
Homework 6	April 28 <sup>th</sup>	Multiple Regression	10%

### **Mini Research Study (35%)**

The final project for this course is a 15-20 page (excluding references) quantitative research mini-paper. The completed paper must include the following components, which we will discuss in class: Title page, abstract (200 word max), introduction, literature review, theoretical or conceptual framework, research questions, methods, preliminary findings, implications, and references. The goal of this project is for you to begin a study that could be submitted to a conference or peer-reviewed journal, though it could be the starting point for dissertation/thesis proposals. As a result, you must use one of the inferential techniques covered in this class (sorry, no solely descriptive analyses). While you will be required to present some data analysis/findings, it is ok for this to be preliminary. The paper will be prepared across three main parts with the following components due at the dates listed below:

	Due Date	Value
Topic and Data Source	Feb. 10 <sup>th</sup>	0%, but required
Part I: Introduction, Research Question(s), Literature Review, and Theory	March 3 <sup>rd</sup>	10%
Part II: Methods	April 7 <sup>th</sup>	10%
Part III: Full Paper	May 5 <sup>th</sup>	15%

Here are more details about the components of the mini research study:

**Topic (0.5-1.0 pages):** By Week 4 (February 10<sup>th</sup>), you will be required to submit a brief write-up of your proposed topic and data source in Canvas. I will provide written feedback on your topic and data, approving you to begin working on your final paper or providing redirection for you to refine your topic. This is not graded but is required in order to move forward on your mini research study.

**Part I. Introduction, Research Question(s), Literature Review, and Theory (7.0-10.0 pages):** In 2-3 pages, introduce your research study. Clearly identify the problem you are seeking to address and its importance, provide a brief background on the problem, and clearly state your research question(s). In 5-7 pages, compose a brief literature review and description of your study's theoretical or conceptual framework. Be sure to include at title page and references. For now, do not worry about the abstract.

**Part II. Methods (4.0-5.0 pages):** In 4-5 pages, describe the research design and specific methods you are using in your study. Be sure to cover the following topics: (1) population and sampling, (2) data collection procedures and/or sources, (3) dependent and independent variables and their connection to the theoretical/conceptual framework, and (4) data analysis or methodological techniques. Add Part II to your revised Part I, update your reference list, and submit to Canvas. Again, do not worry about the abstract.

**Part III. Full Paper (15.0-20.0 pages):** This is your final assignment. Begin by combining your revised Part I and Part II. In the remaining 4-5 pages, present the preliminary findings of your quantitative analyses, including any tables and figures you see fit. Conclude your paper with a discussion section, where you will interpret your findings, consider implications for practice and/or policy, and suggest directions for future research. Do not forget to update your reference list and to include the 200 word (max) abstract to its own page after the title page, but before the body of the paper. Please turn in your Stata .do file with your final project.

## Grading

The grading/evaluation policy for this course is consistent with the standard grading system of Saint Louis University.

100-94	A	4.00	76-73	C	2.00
93-90	A-	3.70	72-70	C-	1.70
89-87	B+	3.30	69-65	D	1.00
86-83	B	3.00	65 or below	F	0.00

82-80	B-	2.70	FQ	0.00
79-77	C+	2.30		

<https://catalog.slu.edu/academic-policies/academic-policies-procedures/grading-system/>

## Course Policies

### Course Changes

I reserve the right to amend this syllabus throughout the term. This may include adjusting assignments, due dates, readings, the course schedule, etc. In the (rare) event I make such changes, you will be given reasonable notice. An updated version of the course syllabus and schedule will be uploaded to Canvas immediately.

### Inclusive Learning

One of my chief responsibilities as your instructor is to help create and facilitate a positive, welcoming, and inclusive learning environment. Together, we must work to create a space and culture of mutual respect, one where a variety of ideas and opinions can be expressed, understood, and tested. Remember, both speaking up and listening are valuable tools for furthering thoughtful, enlightening dialogue. With that, racist, sexist, homophobic, ableist, or any language or actions that degrade, threaten, or attempt to silence others will not be tolerated.

### Attendance and Participation

Students are expected to attend every class session or notify me in advance that they will be absent along with the reason for the absence. In emergency situations where advance notification is not possible, please try to reach out as soon as you are able. I understand that emergencies happen. Students who miss two class sessions without approval from me will have their final grade reduced by a whole letter grade (e.g., A to B, B to C). Missing three class sessions without authorization may result in a grade of FQ.

While this class was designed for exclusively in-person instruction, given the nature of the pandemic, I reserve the right to allow students (on a case-by-case basis) to temporarily participate in class via Zoom. If you are unable to attend a class session in-person, but would like to participate via Zoom, you will need to email that request to me as soon as possible (preferably 24 hours before class). I understand that this amount of notice is not always possible. However, advanced notice is required so that I may adjust in-class activities to maximize engagement with Zoom-participating students.

All class sessions will be recorded via Panopto and made available to students on Canvas within 24hrs following the class.

### Electronics

Please silence your cell phones while in class. I understand circumstances sometimes require that you monitor your phone. However, if you need to make a call or send text messages, please leave class to do so. Laptops and tablets may be used for note taking and other class activities only. Please do not use class time to check email or

browse the web. I reserve the right to ask students to put away their electronics if they become distracting.

### **Mandatory Syllabus Statement on In-Person Class Attendance and Participation (2021-2022)**

The health and well-being of SLU's students, staff, and faculty are critical concerns, as is the quality of our learning environments. Accordingly, the following University policy statements on in-person class attendance are designed to preserve and advance the collective health and well-being of our institutional constituencies and to create the conditions in which all students have the opportunity to learn and successfully complete their courses.

1. Students who exhibit any [potential COVID-19 symptoms](#) (those that cannot be attributed to some other medical condition the students are known to have, such as allergies, asthma, etc.) shall absent themselves from any in-person class attendance or in-person participation in any class-related activity until they have been evaluated by a qualified medical official. Students should contact the [University Student Health Center](#) for immediate assistance.
2. Students (whether exhibiting any of potential COVID-19 symptoms or not, and regardless of how they feel) who are under either an isolation or quarantine directive issued by a qualified health official must absent themselves from all in-person course activities per the stipulations of the isolation or quarantine directive.
3. Students are responsible for notifying their instructor of an absence as far in advance as possible; when advance notification is not possible, students are responsible for notifying each instructor as soon after the absence as possible. Consistent with the [University Attendance Policy](#), students also are responsible for all material covered in class and must work with the instructor to complete any required work. In situations where students must be absent for an extended period of time due to COVID-19 isolation or quarantine, they also must work with the instructor to determine the best way to maintain progress in the course as they are able based on their health situation.
4. Consistent with the University Attendance Policy, students may be asked to provide medical documentation when a medical condition impacts a student's ability to attend and/or participate in class for an extended period of time.
5. As a temporary amendment to the current [University Attendance Policy](#), all absences due to illness or an isolation/quarantine directive issued by a qualified health official, or due to an adverse reaction to a COVID-19 vaccine, shall be considered "Authorized" absences.

## **Canvas**

Students will be able to access the course syllabus, articles, resources, and lecture slides on Canvas. Lecture slides will be posted the week following the date listed on the course schedule. All assignments must be submitted through Canvas.

## **Deadlines**

Assignments must be submitted through Canvas by the start of class on the day they are due unless otherwise noted or prior arrangements are made with me. Students should email me as quickly as possible about any special circumstances that may prevent them from submitting their assignment on time. I am happy to work with students, but I do expect that you are managing your time and workload efficiently. With that, please do not wait until the day an assignment is due to begin or “fine tune” your assignment. In my experience, this is often a recipe for a late or lower quality assignment. Finally, I reserve the right to penalize late assignments (without prior arrangements) by up to 15% per week past due.

## **Writing Format**

All written assignments should adhere to the 7<sup>th</sup> edition of APA style. If you do not have a copy of the latest APA style manual, I would strongly encourage you to become familiar with the Purdue University OWL website:

[https://owl.purdue.edu/owl/purdue\\_owl.html](https://owl.purdue.edu/owl/purdue_owl.html).

Unless otherwise noted, papers should be double-spaced, utilize in-text citations as appropriate and include a reference list, have one-inch margins, include page numbers, a title page, and be in a 12-point standard font (e.g., Arial, Times New Roman, Calibri). Tables and figures should appear on individual pages after the references section. As a graduate-level course, graduate-level writing is expected. Excessive errors in grammar, punctuation, spelling, and clarity of expression will result in a lower grade. Any papers using sexist, racist or otherwise inappropriate language will be returned without a grade.

## **Academic Integrity**

Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is “the pursuit of truth for the greater glory of God and for the service of humanity.” Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care, and community service through which SLU fulfills its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern. The full University-level Academic Integrity Policy can be found on the Provost's Office website at:

[https://www.slu.edu/provost/policies/academic-and-course/policy\\_academic-integrity\\_6-26-2015.pdf](https://www.slu.edu/provost/policies/academic-and-course/policy_academic-integrity_6-26-2015.pdf).

## **Mandatory Syllabus Statement on Face Masks (2021-2022)**

Throughout the COVID-19 pandemic, key safeguards like face masks have allowed SLU to safely maintain in-person learning. If public health conditions and local, state, and federal restrictions demand it, the University may require that all members of our campus community wear face masks indoors.

Therefore, any time a University-level face mask requirement is in effect, face masks will be required in this class. This expectation will apply to all students and instructors unless a medical condition warrants an exemption from the face mask requirement (see below).

When a University-wide face mask requirement is in effect, the following will apply:

- Students who attempt to enter a classroom without wearing masks will be asked by the instructor to put on their masks prior to entry. Students who remove their masks during a class session will be asked by the instructor to resume wearing their masks.
- Students and instructors may remove their masks briefly to take a sip of water but should replace masks immediately. The consumption of food will not be permitted.
- Students who do not comply with the expectation that they wear a mask in accordance with the University-wide face mask requirement may be subject to disciplinary actions per the rules, regulations, and policies of Saint Louis University, including but not limited to those outlined in the *Student Handbook*. Non-compliance with this policy may result in disciplinary action, up to and including any of the following:
  - Dismissal from the course(s)
  - Removal from campus housing (if applicable)
  - Dismissal from the University
- To immediately protect the health and well-being of all students, instructors, and staff, instructors reserve the right to cancel or terminate any class session at which any student fails to comply with a University-wide face mask requirement.

When a University-wide face mask requirement is not in effect, students and instructors may choose to wear a face mask or not, as they prefer for their own individual comfort level.

### **ADA Accommodations for Face Mask Requirements**

Saint Louis University is committed to maintaining an inclusive and accessible environment. Individuals who are unable to wear a face mask due to medical reasons should contact the Center for Accessibility and Disability Resources (students) or Human Resources (instructors) to initiate the accommodation process identified in the University's [ADA Policy](#). Inquiries or concerns may also be directed to the [Office of Institutional Equity and Diversity](#). Notification to instructors of SLU-approved ADA accommodations should be made in writing prior to the first-class session in any term (or as soon thereafter as possible).

## **Student Support**

### **Basic Needs**

Balancing work, life, and education can be especially challenging at times. If you find yourself in personal or academic distress and/or experiencing challenges such as securing food or difficulty navigating campus resources, please contact the Dean of



Students Office ([deanofstudents@slu.edu](mailto:deanofstudents@slu.edu) or 314-977-9378) for support. Furthermore, please notify me if you are comfortable in doing so, as this will enable me to assist you with finding the resources you may need.

### **University Counseling Center**

The University Counseling Center (UCC) offers free, short-term, solution-focused counseling to Saint Louis University undergraduate and graduate students. UCC counselors are highly trained clinicians who can assist with a variety of issues, such as adjustment to college life, troubling changes in mood, and chronic psychological conditions. To make an appointment, call 314-977-8255 (TALK), or visit the clinic on the second floor of Wuller Hall.

### **Student Success Center**

In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. The Student Success Center assists students with academic-related services and is located in the Busch Student Center (Suite, 331). Students can visit <https://www.slu.edu/life-at-slu/student-success-center/> to learn more about tutoring services, university writing services, disability services, and academic coaching.

### **University Writing Services**

Students are encouraged to take advantage of University Writing Services in the Student Success Center; getting feedback benefits writers at all skill levels. Trained writing consultants can help with writing projects, multimedia projects, and oral presentations. University Writing Services offers one-on-one consultations that address everything from brainstorming and developing ideas to crafting strong sentences and documenting sources. For more information, call the Student Success Center at 314-977-3484 or visit <https://www.slu.edu/life-at-slu/student-success-center/>.

### **Disability Accommodations**

Students with a documented disability who wish to request academic accommodations must formally register their disability with the University. Once successfully registered, students also must notify me that they wish to use their approved accommodations in the course. Please contact the Center for Accessibility and Disability Resources (CADR) to schedule an appointment to discuss accommodation requests and eligibility requirements. Most students on the St. Louis campus will contact CADR, located in the Student Success Center and available by email at [accessibility\\_disability@slu.edu](mailto:accessibility_disability@slu.edu) or by phone at [314.977.3484](tel:314.977.3484). Once approved, information about a student's eligibility for academic accommodations will be shared with course instructors by email from CADR and within the instructor's official course roster. Students who do not have a documented disability but who think they may have one also are encouraged to contact to CADR. Confidentiality will be observed in all inquiries.

## **Title IX**

Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual harassment, including sexual assault, stalking, domestic or dating violence, we encourage you to report this to the University. If you speak with a faculty member about an incident that involves a Title IX matter, *that faculty member must notify SLU's Title IX Coordinator and share the basic facts of your experience*. This is true even if you ask the faculty member not to disclose the incident. The Title IX Coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus. Anna Kratky is the Title IX Coordinator at Saint Louis University (DuBourg Hall, room 36; [anna.kratky@slu.edu](mailto:anna.kratky@slu.edu); 314-977-3886).

If you wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK or make an anonymous report through SLU's Integrity Hotline by calling 1-877-525-5669 or online at <http://www.lighthouse-services.com/slu>. To view SLU's policies, and for resources, please visit the following web addresses: <https://www.slu.edu/about/safety/sexual-assault-resources/index.php> and <https://www.slu.edu/general-counsel>.

## Course Schedule

### **Week 1 (January 20): Course Introduction**

### **Week 2 (January 27): Defining Research Problems and Reviewing the Literature**

Creswell, J. W. (2018). Chapter 2: Identifying a research problem. In *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson Education.

Creswell, J. W. (2018). Chapter 3: Reviewing the literature. In *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson Education.

### **Week 3 (February 3): Quantitative Research Designs and Sampling**

Creswell, J. W. (2018). Chapter 4: Specifying a purpose and research questions or hypotheses. In *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson Education.

Weinberg & Abramowitz (2020): Chapter 9 Sampling

### **Week 4 (February 10): Introduction to Stata & Managing Data in Stata**

Weinberg & Abramowitz (2020): Chapter 1 Introduction

Watch: Intro to Stata with Dr. Turk

Due: Topic and Data Source

### **Week 5 (February 17): Descriptive Analysis in Stata**

Weinberg & Abramowitz (2020): Chapter 2 Univariate Distributions

Weinberg & Abramowitz (2020): Chapter 3 Measures of Location, Spread, and Skewness

Weinberg & Abramowitz (2020): Chapter 4 Re-Expressing Variables

Due: Homework 1 Data Cleaning

### **Week 6 (February 24): T-Tests in Stata**

Weinberg & Abramowitz (2020): Chapter 11 Inferences Involving the Mean When  $\sigma$  Is Not Known: One- and Two-Sample Designs

Due: Homework 2 Descriptive Analysis

**Week 7 (March 3): One-Way ANOVA in Stata**

Weinberg & Abramowitz (2020): Chapter 13 One-Way Analysis of Variance

Due: Homework 3 T-Test

Due: Part I: Introduction, Research Question(s), Literature Review, and Theory

**Week 8 (March 10): Two-Way ANOVA in Stata**

Weinberg & Abramowitz (2020): Chapter 14 Two-Way Analysis of Variance

Due: Homework 4 One-Way ANOVA

<<<Spring Break March 14-18>>>

**Week 9 (March 24): Correlation and Simple Linear Regression in Stata**

Weinberg & Abramowitz (2020): Chapter 5 Exploring Relationships Between Two Variables

Weinberg & Abramowitz (2020): Chapter 6 Simple Linear Regression

**Week 10 (March 31): Nonparametric Methods (Asynchronous Class)**

Weinberg & Abramowitz (2020): Chapter 18 Nonparametric Methods

Due: Homework 5 Correlation & Simple Linear Regression

**Week 11 (April 7): Multiple Regression in Stata, I**

Weinberg & Abramowitz (2020): Chapter 16 An Introduction to Multiple Regression

Due: Part II: Methods

<<<Easter Break April 18>>>

**Week 12 (April 21): Final Project Class Workshop**

**Week 13 (April 28): Multiple Regression in Stata, II**

Weinberg & Abramowitz (2020): Chapter 17 Two-Way Interactions in Multiple Regression

Due: Homework 6 Multiple Regression

**Week 14 (May 5): Wrap-Up**

Due: Part III: Full Paper