

RMTD 404 Online
Introduction to Educational Statistics
(Fall 2020)

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Office: Lewis Towers, Room 1136

Office hour: By appointment

Class Meetings: None (asynchronous online class)

Course Description

This course provides an introduction to data analysis and statistical inference. Specially, students will learn to

- describe data (quantitatively and graphically)
- formulate research hypothesis and conduct hypothesis tests
- select and compute statistical estimates
- use computer packages to accomplish these tasks
- interpret and write about the results of the estimates and tests
- make sure that all conclusions are justified given the results

Knowledge of basic algebra is required, as is an understanding of the fundamental principles of descriptive statistics and hypotheses; knowledge of higher mathematics (e.g., trigonometry, calculus) is not required.

Required Text

Howell, D.C. (2013). *Statistical Methods for Psychology* (8th ed.). Belmont, CA: Wadsworth, Cengage Learning.

Recommended Text (Only need one—The first two options are online and free; the third option is for those who prefer to have a physical book as a resource)

- 1) Basic information about using SPSS from University of Texas Statistics Department:
https://stat.utexas.edu/images/SSC/documents/SoftwareTutorials/SPSS_GettingStarted.pdf
- 2) Howell, D.C. (2013). *Fundamental Statistics for the Behavioral Sciences* (8th ed.):
<https://www.uvm.edu/~dhowell/fundamentals8/SPSSManual/SPSSLongerManual/SPSSLongerManual.html>

OR

- 3) Field, A. (2013). *Discovering statistics using SPSS* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Technological Knowledge and Skills

Students will use SPSS (Statistical Package for the Social Sciences) to analyze data using NELS (National Education Longitudinal Study) dataset in this class. NELS is one of the largest and most important datasets collected by the U.S. government, including extensive measurements of students' beliefs, aspirations, attitudes, and background, as well as related information from teachers, parents, and schools. Students are expected to be able to graphically summarize data (e.g., using histograms) and perform hypothesis tests (e.g., t-tests, chi-square tests, and regression).

Study Materials and Weekly Quizzes

You will learn a new topic each week. A chapter in the required text is assigned to you, and a recorded PowerPoint presentation using Panopto is provided to elaborate the topic of the week. A quiz associated with the assigned reading and recording is given each week unless other activities are provided. Make sure you finish reading and watching the recording before you start the quiz. All the studying materials will be available by Monday 8am (or earlier) each week. An e-mail will be sent to students when the materials are available. Please pay attention to the due date for the quizzes as they will not be available after they are due. Late work is not acceptable unless prior arrangements have been made with the instructor. Late assignments will automatically be worth half of their original point value.

Final Exam

One exam is given at the end of the semester. More details will be provided on Sakai.

Evaluation

Grades will be based on the accumulation of points related to the quizzes and final exam. There will be 100 total possible points, with the points distributed as follows:

Quizzes	80%
Final exam	20%

The grade ranges in terms of percentages are:

100.0-90.0 = A	84.9-80.0 = B+	69.9-65.0 = C+	54.9 and below = F
89.9-85.0 = A-	79.9-75.0 = B	64.9-60.0 = C	
	74.9-70.0 = B-	59.9-55.0 = C-	

Online Course Requirements

To ensure learning occurs in the online environment, there are certain requirements for this class:

Required Access

- At least a DSL Internet connection
- Loyola Email Account with reliable access
- Sakai – We post all the materials for this class in Sakai

- Access to SPSS - Most of the computers on Water Towers Campus are equipped with the latest version of SPSS. Students can also obtain a copy of IBM SPSS Statistics for home use free of charge. For details about obtaining a copy of the software for home use, please go to <https://www.luc.edu/its/itrs/researchtechnologies/home-use.shtml> (see the “IBM SPSS Statistics” section under the “Student Home Use” heading). The version available from ITS will be sufficient for this class.

Required Familiarity

- Be able to download and upload files
- Be able to use Microsoft Office Package, especially Microsoft Word and Microsoft PowerPoint

In addition to hardware access and software utilization, the following represent factors that facilitate a productive and effective online learning experience. (Material adapted from the University of Wisconsin Online website on Online Etiquette.

<http://online.uwc.edu/technology/etiquette>)

- Tone down your language. Given the absence of face-to-face cues, written text can easily be misinterpreted. Avoid the use of strong or offensive language and the excessive use of exclamation points. If you feel particularly strongly about a point, it may be best to write it first as a draft and then to review it before posting it, in order to remove any strong language.
- Keep a straight face. In general, avoid humor and sarcasm. These frequently depend on facial or tone of voice cues absent in text communication or on familiarity with the reader.
- Be forgiving. If someone states something that you find offensive, mention this directly to the instructor. Remember that the person contributing to the discussion is also new to this form of communication. What you find offensive may quite possibly have been unintended and can best be cleared up by the instructor.
- The recorder is on. Think carefully about the content of your message before contributing it. Once sent to the group, there is no taking it back. Also, although the grammar and spelling of a message typically are not graded, they do reflect on you. Your audience might not be able to decode misspelled words or poorly constructed sentences. It is good practice to compose and check your comments in a word-processor before posting them.
- Test for clarity. Messages may often appear perfectly clear to you as you compose them, but turn out to be perfectly obtuse to your reader. One way to test for clarity is to read your message aloud to see if it flows smoothly. If you can read it to another person before posting it, then even better.
- Netspeak. Although electronic communication is still young, many conventions have already been established. **DO NOT TYPE IN ALL CAPS**. This is regarded as shouting and is out of place in a classroom. Acronyms and emoticons

(arrangements of symbols to express emotions) are popular, but excessive use of them can make your message difficult to read.

SOE Vision

The School of Education of Loyola University Chicago is a community that seeks to transform members to impact local and global communities through the principles of social justice.

School of Education Mission

The School of Education at Loyola University Chicago, a Jesuit Catholic urban university, supports the Jesuit ideal of knowledge in the service of humanity. We endeavor to advance professional education in service of social justice, engaged with Chicago, the nation, and the world. To achieve this vision, the School of Education participates in the discovery, development, demonstration, and dissemination of professional knowledge and practice within a context of ethics, service to others, and social justice. We fulfill this mission by preparing professionals to serve as teachers, administrators, psychologists, and researchers who work across the developmental continuum, and by conducting research on issues of professional practice and social justice.

School of Education Conceptual Framework

Our School's Conceptual Framework – ***Social Action through Education*** – guides the curricula of School of Education programs in the preparation of carrying out the mission of social justice. These dimensions of the conceptual framework also serve as the foundation to the School of Education – standards that are explicitly embedded in major benchmarks across all SOE programs. Our conceptual framework is described here: www.luc.edu/education/mission/. Social inequities exist for many subgroups within the population (including but not limited to subgroups based on race, gender, sexual orientation, social class, ethnicity, and ability). This course will help students develop the foundational knowledge needed to carry out quantitative research that could offset social inequities that exist in our society for one, some, or all groups.

Objectives

The essential objectives for this course are:

1. Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
2. Learning to apply course material (to improve thinking, problem solving, and decisions)
3. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course
4. Learning appropriate methods for collecting, analyzing, and interpreting numerical information

School of Education Commitment - COVID-19

Loyola's School of Education (SOE) recognizes that this is an unprecedented time. We understand that moving into the 2020-2021 academic year while living in the context of the COVID-19 pandemic may stir feelings of uncertainty, fear, or anxiousness. We want you to know that your safety, health, and well-being, as well as that of our faculty and staff, remain our

primary concern. We want to be able to support you in any way that we can. We ask you to embody the Jesuit value of *Cura Personalis*, or care for the whole person, as we prepare to learn together. We ask that you consider your way of being in this community, to act with care, and treat all with dignity to keep yourself and others safe.

The University understands that you may encounter obstacles that make reaching academic goals more difficult. We strongly encourage you to access the Student Resources on [Loyola's COVID-19 Response webpage](#) for information, supports, and resources on basic needs such as housing, food, financial aid, and medical and mental health. This web page also offers information on official University communications, access to technology, and student services. All Loyola University Chicago administrators, faculty, and advisors are also here for you.

The SOE is committed to working with all students to address any challenges that may arise during the semester. Please reach out to your professor as early as possible to discuss any accommodations you think may be necessary in order for you to successfully complete your coursework. We know this will be a semester like none other, but through collaboration, communication, and shared responsibility, we will not only get through this difficult time; we will thrive.

COVID-19 Reporting Protocol

In preparation for our upcoming semester, Loyola University Chicago's Emergency Response Management team has been working to develop protocols in accordance with Centers for Disease Control and Prevention (CDC) guidelines that help ensure the health and safety of our community. Given the rising number of COVID-19 cases across our country, it is very likely that incidence within our community will occur in the fall.

Students, faculty, and staff who have tested positive for COVID-19 must report their case to the University as soon as possible. **If you have tested positive for the virus, please contact us at covid-19report@LUC.edu or by calling 773-508-7707. All COVID-19-related questions or feedback should continue to be sent to covid-19support@LUC.edu, not the new case reporting email address.**

Loyola University Chicago School of Education Syllabus Addendum

Smart Evaluation

Towards the end of the course, students will receive an email from the Office of Institutional Effectiveness as a reminder to provide feedback on the course. Students will receive consistent reminders throughout the period when the evaluation is open, and the reminders will stop once the evaluation is completed.

- The evaluation is completely anonymous. When the results are released, instructors and departments will not be able to tell which student provided the individual feedback.
- Because it is anonymous and the results are not released to faculty or departments until after grades have been submitted, the feedback will not impact a student's grade.

- The feedback is important so that the instructor can gain insight in to how to improve their teaching and the department can learn how best to shape the curriculum.

Special Circumstances--Receiving Assistance

Students are urged to contact me should they have questions concerning course materials and procedures. If you have any special circumstance that may have some impact on your course work, please let me know so we can establish a plan for assignment completion. If you require assignment accommodations, please contact me early in the semester so that arrangements can be made with Services for Students with Disabilities (SSWD) (<http://www.luc.edu/sswd/>).

Syllabus Addendum Link

- <http://www.luc.edu/education/syllabus-addendum/>

This link directs students to statements on essential policies regarding *academic honesty*, *accessibility*, *ethics line reporting* and *electronic communication policies and guidelines*. We ask that you read each policy carefully.

This link will also bring you to the full text of our conceptual framework that guides the work of the School of Education – *Social Action through Education*.

Schedule

Week	Dates	Topics	Readings
1	8/24	Introduction & scales of measurement	Ch.1
2	8/31	Describing data & introduction to SPSS	Ch.2
3	9/7	The normal distribution	Ch.3
4	9/14	Sampling distribution & hypothesis testing	Ch.4
5	9/21	Hypothesis tests applied to means: Variance known (z -test)	Ch.7
6	9/28	Hypothesis tests applied to means: Variance unknown (one-sample t -test)	Ch.7
7	10/5	Hypothesis tests applied to means: Variance unknown (two-sample t -test)	Ch.7
8	10/12	Power	Ch.8
9	10/19	Correlation	Ch.9
10	10/26	Simple regression I	Ch.9
11	11/2	Simple regression II	Ch.9
12	11/9	Chi-square I	Ch.6
13	11/16	Chi-square II	Ch.6
14	11/23	~ ~ ~ ~ Thanksgiving Break ~ ~ ~ ~	
15	11/30	No material—review for final exam	
16	12/7	Final Exam	

Evaluation of Disposition in RMTD 404

Rubric

Area	Target	Acceptable	Unacceptable
Systematic Inquiry AEA A.3	Candidate communicates effectively and appropriately with faculty and peers.	Candidate is working on communicating effectively and appropriately with faculty and peers.	Candidate is unable to communicate effectively and appropriately with faculty and peers.
Responsibilities for General and Public Welfare AEA E.3	Candidate’s written work is appropriate and effective for the course.	Candidate’s written work is sometimes appropriate and effective for the course.	Candidate’s written work is inappropriate and ineffective for the course.
Timeliness	Candidate is able to meet all deadlines.	Candidate is sometimes able to meet all deadlines.	Candidate is unable to meet all deadlines.
Integrity/Honesty AEA C.5	Candidate appropriately represents procedures, data, and findings – attempting to prevent misuse of their results.	Candidate represents procedures, data, and findings in a manner that is likely to allow the misuse of their results.	Candidate misrepresents procedures, data, and findings. There is minimal attempt to prevent misuse of their results.