

RMTD 404
Introduction to Educational Statistics
(Fall 2019)

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Course Description

This course provides an introduction to data analysis and statistical inference. Specially, students 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 option is online and free; the second option is for those who prefer to have a physical book as a resource)

- 1) Howell, D.C. (2013). *Fundamental Statistics for the Behavioral Sciences* (8th ed.).

<https://www.uvm.edu/~dhowell/fundamentals8/SPSSManual/SPSSLongerManual/SPSSLongerManual.html>

OR

- 2) 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 Adobe Connect 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 points accumulated on homework and examinations. There will be 100 total possible 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. For home use, you can purchase or rent the SPSS Graduate Package. More information can be found in the section “IBM SPSS Statistics 25” under the STUDENT HOME USE section in:

<https://www.luc.edu/its/itrs/researchtechnologies/home-use.shtml>. For the purposes of this class, the “IBM SPSS Statistics Base GradPack” versions 20 and higher will suffice.

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.

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

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.

Dispositions

All students are assessed on one or more dispositional areas of growth across our programs: ***Professionalism, Inquiry, and Social Justice***. The instructor in your course will identify the dispositions assessed in this course and you can find the rubrics related to these dispositions in LiveText. *For those students in non-degree programs, the rubric for dispositions may be available through Sakai, TaskStream or another platform.* Disposition data is reviewed by program faculty on a regular basis. This allows faculty to work with students to develop throughout their program and address any issues as they arise.

LiveText

All students, *except those who are non-degree*, must have access to LiveText to complete the benchmark assessments aligned to the Conceptual Framework Standards and all other accreditation, school-wide and/or program-wide related assessments. You can access more information on LiveText here:

<https://www.luc.edu/education/admission/tuition/course-management-fee/>

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	8/26	Introduction & scales of measurement	Ch.1
2	9/2	Describing data & introduction to SPSS	Ch.2
3	9/9	The normal distribution	Ch.3
4	9/16	Sampling distribution & hypothesis testing	Ch.4
5	9/23	Hypothesis tests applied to means: Variance known (z -test)	Ch.7
6	9/30	Hypothesis tests applied to means: Variance unknown (one-sample t -test)	Ch.7
7	10/7	~ ~ ~ ~ Fall Break -- No Material ~ ~ ~ ~	
8	10/14	Hypothesis tests applied to means: Variance unknown (two-sample t -test)	Ch.7
9	10/21	Power	Ch.8
10	10/28	Correlation	Ch.9
11	11/4	Simple regression I	Ch.9
12	11/11	Simple regression II	Ch.9
13	11/18	Chi-square I	Ch.6
14	11/25	Chi-square II	Ch.6
15	12/2	~ ~ ~ ~ Study for Final Exam ~ ~ ~ ~	
16	12/9	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.