

**RMTD 404 - Online**  
**Introduction to Educational Statistics**

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**Office hour:** By appointment

**School of Education Conceptual framework ([www.luc.edu/education/mission/](http://www.luc.edu/education/mission/))**

Our School's conceptual framework is "social action through education". This course contributes to this framework by equipping students with knowledge and experience in statistics used in quantitative research. Through conducting, interpreting, and reporting reliable social science studies, researchers can help further the scholarly understanding of the events and practices that influence the field of education. The ultimate outcome of this understanding is to ensure that all individuals, no matter their ability, race, religion, socioeconomic status, age or gender benefit from effective research.

**Course Goals**

This course provides an introduction to data exploration, basic data analysis, and statistical inference. Specifically, students learn to:

- describe data (quantitatively and graphically),
- formulate research hypothesis and conduct hypothesis tests,
- select and compute appropriate statistical estimates,
- use SPSS (Statistical Package for the Social Sciences) to accomplish these tasks, and
- interpret and write about the results of the estimates and tests.

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. (2012). *Statistical Methods for Psychology* (8<sup>th</sup> ed.) Pacific Grove, CA: Duxbury. ISBN-10: 1111835489; ISBN-13: 978-1111835484.

**Recommended text**

Field, A. (2013). *Discovering statistics using IBM SPSS* (4<sup>th</sup> ed.) Thousand Oaks, CA: SAGE Publications. ISBN-10: 1446249182; ISBN-13: 978-1446249185.

\*This book contains not only the instruction of conducting analyses using SPSS but also the clear elaboration of important statistical concepts in plain English. I'd

recommend this book especially for those who would like to pursue advanced statistics in the near future.

### **Major datasets**

In this class, students use SPSS to analyze smaller datasets that are created from the National Education Longitudinal Study (NELS). NELS is one of the largest and most important studies conducted by the U.S. government. The data collected include extensive measurements of students' beliefs, aspirations, attitudes, and background, as well as related information from teachers, parents, and schools. We use the datasets to learn to graphically summarize data (e.g., using histograms) and perform hypothesis tests (e.g.,  $t$ -tests, chi-square tests, correlations, and regression).

### **Weekly study materials and quizzes**

Students learn a new topic each week. A chapter in the required text is assigned, and a recorded PowerPoint presentation using either Adobe Connect or Panopto is provided to elaborate the topic of the week. A quiz associated with the weekly study materials is given each week unless other activities are provided. The quizzes are different in length. Some of them take 10 minutes to finish while others may take an hour.

*\*\*It is important to finish reading and watching the recording before you start the quiz.*

The course materials for each week will be available by *Monday 8 am*, though I will try to make them available on Friday before the week starts as I know some students prefer to work ahead of time. An e-mail will be sent to you when the materials are available so you do not need to check Sakai regularly.

*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.*

### **Final examination**

The final exam is given at the end of the semester. During the time it is available to you, you can find the best time to work on it. You will have about four hours to finish the exam even though the exam is designed to be finished within an hour or so. Students are expected to work on the exam independently.

### **Important notes about this online class**

When you take a class online, you do not have an instructor talking directly to you at a set time each week. Some students seem to think that taking an online course will be easier, and it is patently false. Many students actually found the opposite. It does not necessarily mean that online course is more difficult for you. However, you should expect the way of learning will be different when the format of the class is different.

Below are two tips on studying this online course suggested by faculty and students who took this class online:

1. **Block a specific time in the week to study.** You will learn better if you have a fixed time to study each week so you know you have time to be on top of materials provided to you. When taking online courses, some students put off studying, get behind, and find that they can't catch up. The topics in this class build on one another. Make sure you do not get behind.
2. **Do not expect the workload will be lighter when taking the course online.** Please anticipate that it will take about **5-10 hours** each week to study the materials and complete the quiz each week.

### Evaluation

Grades will be based on points accumulated on quizzes and a final examination. The accumulated points will be converted into a 100-point scale, and the distributions of the points for quizzes and final exam (for calculating the final grade) are:

Weekly Quizzes	80%
Final exam	20%

The grade ranges in terms of percentage 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*

Stable 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 equip with the latest version of SPSS. For home use, you will have to *purchase* or *rent* the SPSS Graduate Package. More information can be found in "Student Home Use" section in university's ITS website:  
<http://www.luc.edu/itrs/researchcomputing/home-use.shtml>.

For the purposes of this class, the “IBM SPSS Statistics **Base GradPack**” suffices. The latest version is 25, but version 22 and beyond will work just fine.

### *Required Familiarity*

Be able to download and attach 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.asp>)

- *Tone down your language.* Given the absence of face-to-face clues, 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 either 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 and they do reflect on you; your audience might not be able to decode misspelled words or poorly constructed sentences. It is a 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.

**Dispositions**

Each course in the School of Education focuses on one or more professional dispositions. Students are offered opportunities to receive feedback on their dispositional growth in the areas of professionalism, fairness and/or the belief that all students can learn. The evaluation of SOE student's disposition will be recorded in LiveText. The expected behaviors for specific dispositions for this class and the evaluation rubrics are listed at the end of this syllabus.

**IDEA Objectives**

IDEA is an evaluation system that our School uses to assess whether a class reaches the major goals at the end of the semester. The essential objectives of this course are:

- Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
- Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course
- Learning appropriate methods for collecting, analyzing, and interpreting numerical information

Please see Syllabus Addendum below for more information.

**Loyola University Chicago  
School of Education  
Syllabus Addendum**

**IDEA Course Evaluation Link for Students**

Each course you take in the School of Education is evaluated through the IDEA Campus Labs system. We ask that when you receive an email alerting you that the evaluation is available that you promptly complete it. To learn more about IDEA or to access the website directly to complete your course evaluation go to: <http://luc.edu/idea/> and click on **STUDENT IDEA LOGIN** on the left-hand side of the page.

**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: [LiveText](#).

### **Syllabus Addendum Link**

- [www.luc.edu/education/syllabus-addendum/](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**

The week of		Topics	Readings
1	1/15	Introduction & measure scales	Ch.1
2	1/22	Describing data & introduction to SPSS	Ch.2
3	1/29	Basic concepts of normal distribution	Ch.3
4	2/5	Sampling distribution & hypothesis testing	Ch.4
5	2/12	Hypothesis tests applied to means: Variance known (z-test)	Ch.7
6	2/19	Hypothesis tests applied to means: Variance unknown (one-sample <i>t</i> -test)	Ch.7
7	2/26	Hypothesis tests applied to means: Variance unknown (two-sample <i>t</i> -test)	Ch.7
8	3/5	<i>Spring break. No new materials</i>	
9	3/12	Power	Ch.8
10	3/19	Correlation	Ch.9
11	3/26	<i>Easter break. - Info for the final will be available.</i>	
12	4/2	Simple regression I	Ch.9
13	4/9	Simple regression II	Ch.9
14	4/16	Chi-square I	Ch.6
15	4/23	Chi-square II	Ch.6
	4/30	<i>Final exam</i>	

### Evaluation of Disposition in RMTD 404

#### Rubric

<b>Disposition for evaluation</b>	<b>Target</b>	<b>Acceptable</b>	<b>Unacceptable</b>
<b>Systematic Inquiry</b>	Candidate communicates effectively and appropriately with faculty and peers.	The candidate is working on communicating effectively and appropriately with faculty and peers.	The candidate is unable to communicate effectively and appropriately with faculty and peers.
<b>Responsibilities for General and Public Welfare</b>	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.
<b>Timeliness</b>	The candidate is able to meet all deadlines.	The candidate is sometimes able to meet all deadlines.	The candidate is unable to meet all deadlines.
<b>Integrity/Honesty</b>	Candidates appropriately represent procedures, data, and findings – attempting to prevent misuse of their results.	Candidates represent procedures, data, and findings in a manner that is likely to allow the misuse of their results.	Candidates misrepresent procedures, data, and findings. There is minimal attempt to prevent misuse of their results.