RUTGERS
Graduate School of Education

Department of Educational Psychology
Graduate School of Education
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Statistical Methods I
15:291:531:90-91 (Fall 2021)
3 Credits

Instructor: Dr. John Kerrigan	**E-mail**: johnkerr@math.rutgers.edu
Office Hours: By arrangement	**Location:** Online via Canvas
Mode of Instruction: ___ Lecture ___ Seminar ___ Hybrid _X_ Online ___ Other	**Permission required**: _X_ No __ Yes

Learning goals: Upon successful completion of this course, you will be able to…
1. Describe the distribution of your data and summarize the data using plots.
2. Compute the descriptive statistics.
3. Understand the normal distribution and its properties.
4. Have a basic understanding of correlation and linear regression.
5. Test simple hypotheses by applying probability theory.
6. Interpret the outcomes of an analysis and make a decision based on the statistical results.
7. Describe data and carry out statistical analysis using both hand calculation and computer software (SPSS).

Course catalog description: Descriptive statistics, SPSS statistical package, graphing, normal distribution theory, simple regression, correlation analysis, elementary probability theory, sampling, confidence intervals, and introduction to hypothesis testing.

Class materials/Textbooks: Moore, D. S., McCabe, G. P., & Craig, B. *Introduction to the practice of statistics*. (6th ed or newer). New York: W. H. Freeman.

IBM SPSS Statistics for Windows, Version 20.0 or newer. Armonk, NY: IBM Corp. A calculator that performs basic operations is required for everyone. SPSS will be used to run statistical analyses for homework assignments and class exercises. There are a couple of options to access SPSS. First, you can purchase a copy and install it on your computer. Student version is sufficient for this course. Second, due to the pandemic, the university has made a long list of software available to students. You can log in to Rutgers Virtual Computer Labs from https://labgateway.rutgers.edu. SPSS is one of available computer programs and importantly, it's FREE.

Features of an online course: An online course differs from a traditional face-to-face course in a number of ways. In particular, for this class:
A. There is a strong emphasis on student-driven learning. The instructor's role is of overall facilitator and coordinator.
B. You will be able to work at your convenience. But it is important to be seriously engaged at least five days during each and every week. This is quite different from a traditional course, in which it is perfectly fine to prepare the day before, go to class the day of class, and then not think about the course the other five days a week.
C. We focus on asynchronous rather than synchronous activities. This course will—officially—be all asynchronous.
D. Students do more of the integrative work than in a face-to-face class. This is likely to support long-term memory development.

Each weekly set of activities and readings will run from **Tuesday to Monday night**. As mentioned in part (B), it is expected you will be logging in and contributing to the course dialogue and activities at least five days during each and every week.

Characteristics of successful online learners: Accounts of the general characteristics of the "successful" online learner are ubiquitous. The studies below synthesize research findings about learning online that may be of use to you in this online course.

Smith, Murphy, and Mahoney (2003) recommended that online learners:

1. Use past experiences to develop new learning.
2. Be motivated by intrinsic rather than extrinsic factors.
3. Set their own goals for learning.
4. Evaluate and monitor their own learning.
5. Develop a problem-solving approach.
6. Select their own learning strategies and materials.

Roper (2007) surveyed successful post-secondary online learners directly (those receiving a grade of 3.5 or better) to determine what they would recommend to other students. Among the skills and actions recommended by students were:

1. Developing a time-management strategy.
2. Being active in online discussions.
3. Using the materials, or finding a way to apply newly-learned concepts.
4. Asking questions.
5. Staying motivated.
6. Sharing what works best for you with the instructor.
7. Making connections with other students.

Academic integrity: I expect that you will comply with standards of academic integrity (that is, you will not even think about cheating) in this course. If you need assistance in understanding an assignment or course content, please seek assistance from other appropriate resources or me. Assignments, however, should be your own work, except in cases where I have required a group product. The consequence for violating policies of academic integrity and other elements of the student code of conduct are serious and can have a tremendous negative impact on your academic progress and future career. You should not turn in the same work in two separate classes without the specific written approval of the faculty members involved. Leaving work until the last minute can increase the temptation to plagiarize work from journals or "borrow" friends' work. You can avoid problems by getting your work done early. The Office of Student Conduct supervises issues related to violations of academic integrity (see http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers). Please familiarize yourself with the university policy on academic integrity. See also the resources available for students at http://academicintegrity.rutgers.edu/resources that will help you understand violations of academic integrity.

Office of Disability Services: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the registration form on the ODS website at: https://ods.rutgers.edu/students/registration-form.

Course Grading

50% - Weekly Canvas activities (problem sets, discussions, Playposit videos): Each week you will be responsible for completing reading along with either a discussion response, written assignment to upload, videos to watch, autograded questions to answer, and/or some other type of activity. These weekly activities will be scored on a rubric and graded for accuracy and completion. **Since solutions to problem sets will be posted on the first day of the next week, late homework will not be accepted.**

25% - Midterm exam: There will be one midterm exam given on Friday, 10/22. More details to follow.

25% - Final exam: There will be a final exam given on Tuesday, 12/7. More details to follow.

Help!!

Never fall behind in a mathematics-based course!!!!! Mathematical ideas need time to sink in, and are very difficult to learn quickly right before an exam, so it is important to clear up your confusions sooner rather than later. An excellent way to improve your understanding of the subject is to study together with classmates. Explaining mathematical ideas to others is often the most effective way to sort out your own confusions and clarify your understanding; you don't know just what it is that you don't know until you try explaining it to someone else.

I also warmly encourage all students to contact me at any time at johnkerr@math.rutgers.edu. I can offer you help via e-mail or by meeting on a virtual call. **I very much want you to succeed in this course.**

Tentative Schedule of Learning Activities

Our class "weeks" will run from Tuesday to Monday. All readings, materials, and assignments will be placed in "Modules."

Week	Course Topics
1 (9/1-9/7)	Getting started
2 (9/7-9/13)	1.1-1.3: Displaying and Describing Distributions
3 (9/14-9/20)	1.4: Normal Distribution Theory
4 (9/21-9/27)	2.1-2.3: Scatterplots and Correlation
5 (9/28-10/4)	2.4: Regression Analysis
6 (10/5-10/11)	2.5: Cautions about Regression and Correlation
7 (10/12-10/18)	3.2- 3.4: Design of Experiments, Sampling Design, and Ethics
8 (10/19-10/25)	**Midterm Exam**
10 (10/26-11/1)	4.1-4.2: Randomness and Probability Models
11 (11/2-11/8)	4.3-4.4: Random Variables and Moments
12 (11/9-11/15)	5.1-5.2: Sampling Distributions of Means
13 (11/16-11/22)	6.2: Hypothesis Testing
14 (11/23-11/29)	6.1: Confidence Intervals
15 (11/30-12/6)	Reading Week
16 (12/7-12/13)	**Final Exam**