

DEPARTMENT OF PSYCHOLOGICAL SCIENCE

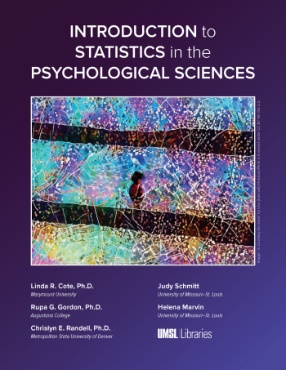
RADOW COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

**PSYC 3000: Statistical Applications in Psychological Science**

Syllabus

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| Course Info |
| Class Information **Credit hours:** 3.0 credit hours (2.0 lecture and 1.0 lab)  **Prerequisites:** Any 1000-level MATH course, or MATH 2202, or STAT 1401, or DATA 1501; and ENGL 1101; Prerequisite or concurrent: PSYC 2210  **Recommended:** PSYC 2500 (Research Methods) is *strongly* encouraged prior to this class  **Modality:** fully online, asynchronous  **Meeting times:** none - fully online through distance learning technology  **Time Zone:** all deadlines in this course follow Eastern time Instructors Chanler Hilley, PhD, Dianhan Zheng, PhD, Hansol Rheem, PhD Course Overview In this course, students are introduced to descriptive and inferential statistical techniques for analyzing psychological research. Coverage encompasses selection of appropriate statistics for differing research questions and designs, and the interpretation and reporting of results. Laboratory work is designed to enable students to apply course topics. Course Learning Outcomes  1. Calculate, interpret, and report (in APA style) descriptive statistics such as mean, median, mode, standard deviation, and variance. 2. Describe the terminology and logic of hypothesis testing. 3. Identify the characteristics of the standard normal curve, how the curve relates to probability, and the information conveyed by standardized scores. 4. Calculate, interpret, and report (in APA style) parametric inferential statistics such as Pearson’s correlation, simple regression, t-tests, and ANOVAs. 5. Use SPSS to calculate statistics and interpret SPSS output files. 6. Define and interpret effect sizes and confidence intervals. 7. Determine when to use each statistical analysis. 8. Link statistics to substantive questions about psychological phenomena. |

# Course Materials

The material covered in this course will be contained in the textbook, virtual lectures/presentations and their related materials, assignments, supplemental materials, and course documents. You are expected to read the chapters *and* complete the course requirements; one of these sources alone will *not* cover all the course content.

### The Course Textbook is Free

Cote, L. R., Gordon, R., Randell, C. E., Schmitt, J., & Marvin, H. (2021). *Introduction to statistics in the psychological sciences*. University of Missouri–St. Louis Libraries.

This textbook is an Open Educational Resource (OER) that was remixed from the Cote and colleagues (2021) version by Drs. Hilley, Zheng, and Rheem to include videos and interactive questions to test your knowledge. [It is **free** and **accessible online** at this link.](https://stats.libretexts.org/Courses/Kennesaw_State_University/Statistical_Applications_in_Psychological_Sciences_with_Multimedia)

In addition, each of the subsections of the textbook are linked directly in your D2L course.

### Technology requirements:

* A **reliable computer** with **internet** connection and capable of running SPSS and Lockdown Browser + Monitor. Tablets and Chromebooks are typically *not* compatible.
* A **webcam** capable of use with Lockdown Browser + Monitor. The webcam needs to be functional and not blurry; if the webcam built into your computer does not work, you will need an external webcam.
* **D2L:** Login to the D2L course regularly to stay abreast of the latest course information. I encourage you to modify your D2L settings to get an email and/or Pulse app notification upon each course announcement.
* **IBM SPSS Statistics**: You are expected to use SPSS on the computer you will be using for this course. Check the “Getting Started” module in D2L for instructions on how to download and install SPSS for *free through KSU*.

### Technology recommendations:

* You may wish to have a separate **calculator** to use for lectures and Practice Problems assignments. The calculator does not have to be “fancy” (but those work fine too); it just needs to be capable of taking square roots. You can check out a calculator for three days at a time from the KSU Library. On quizzes and exams, separate calculators are not permitted – you will use the calculator embedded in Lockdown Browser.
* **Gradescope App** (free; download from your mobile app store)

# How this Course Works

This course is sectioned into three *Units*, each of which contains 5 *Modules*. Each module includes video lectures, textbook chapter(s) and associated Skill Builders, and a module quiz; some modules also contain additional activities to help you practice computing statistics, using software, interpreting, or gaining other skills. SPSS Labs are assigned throughout the semester as noted in the course schedule. To open a module quiz, you must first complete that module’s lectures/activities; finishing a module quiz then opens the subsequent module. You can find more information about each assignment type in the [Assessments & Grading](#_Assessments_&_Grading_1) section.

Each unit culminates with an exam. Exams 1 & 2 contain material for their respective units, but the last exam is a cumulative Final Exam. Exams must be completed on the day they are scheduled.

I encourage you to use the schedule below as your pacing guide for this course. It includes one module (sometimes two) per weekday; each module will take you several hours to complete, so you will not be able to complete all of the modules in the few days prior to each exam. Some course content is spread over multiple modules; in those instances, the Skill Builder deadlines may not follow the module schedule precisely, so please be sure to pay close attention to the due dates in D2L.

## Unit 1 Schedule

| Module Topic & Textbook Chapter  Each chapter has an associated Skill Builder, and each module has a quiz. | Assessments (in addition to typical Module Activities) |
| --- | --- |
| Module 0: Getting Started | Syllabus quiz, pre-course test |
| Module 1: Math Review, Foundations, & Terminology (Ch. 1) | Install SPSS, SPSS Lab 1 |
| Module 2: Frequency & Central Tendency (Ch. 2 & 3) |  |
| Module 3: Variability & Graphing (Ch. 2 & 3) | SPSS Lab 2 |
| Module 4: Distributions of Sample Data & z-Scores (Ch. 4) |  |
| Module 5: Probability & Sampling Distributions (Ch. 5 & 6) |  |
|  | **Unit 1 Exam covers Modules 1-5** |

## Unit 2 Schedule

| Module Topic & Textbook Chapter  Each chapter has an associated Skill Builder, and each module has a quiz. | Assessments (in addition to typical Module Activities) |
| --- | --- |
| Module 6: NHST (Ch. 7) |  |
| Module 7: Comparing Group Means (Ch. 8) |  |
| Module 8: Effect Sizes & Confidence Intervals (Ch. 7 & 8) |  |
| Module 9: Dependent Samples t-tests (Ch. 9) |  |
| Module 10: Independent Samples t-tests (Ch. 10) | SPSS Lab 3 |
|  | **Unit 2 Exam covers Modules 6-10** |

## Unit 3 Schedule

| Module Topic & Textbook Chapter  Each chapter has an associated Skill Builder, and each module has a quiz. | Assessments (in addition to typical Module Activities) |
| --- | --- |
| Module 11: Chi-Square Tests (Ch. 15) |  |
| Module 12: One-Way ANOVA & Post-Hoc Tests (Ch. 11) |  |
| Module 13: ANOVA using SPSS & Factorial ANOVA (Ch. 12) | SPSS Lab 4 |
| Module 14: Pearson’s Correlation (Ch. 13) |  |
| Module 15: Regression (Ch. 14) | SPSS Lab 5 |
| Quiz 16 & Course Outro Tasks |  |
|  | **Final Exam is cumulative** |

# Assessments & Grading

## Assessments

The process of learning is fun and complex, and learning statistics can be a particular challenge! I know you can master the content of this course, and it is set up to help you do so by engaging with the course material *throughout* the entire semester. Said differently: my goal is not for you to simply complete assignments/quizzes/exams and get a grade for them – the goal is to *learn something* along the way. The material we cover in this course is directly relevant to what you will be doing in PSYC 4100 and is the foundation for most knowledge in the field of psychological science. I want you to keep this in mind as you progress through this class. Be mindful about your approach, and practice metacognitive strategies along the way.

Assessments in this course are intended to provide multiple opportunities for you to **build skills** and to **demonstrate applied mastery** of the course content in several ways. They will assess content covered in *all* of the course materials; please do not assume that exclusively listening to lectures will give you all the knowledge and skills that you need. Although the ability to analyze and interpret data are the primary focus of the assignments, learning foundational concepts and how they apply to analyses, how to use SPSS, and the ability to think critically about and troubleshoot analyses are also of major importance. Thus, just like you would in real research scenarios, *you will encounter questions, problems, and uncertainties about your analyses* (especially in the Practice Problems assignments). This is usually intentional, meaning I have given you just enough information to answer the question while still requiring that you do some investigation or additional reading, review, etc.

Please note that although assignments and exams are primarily geared toward the content covered in the modules immediately preceding them, due to the cumulative nature of statistics you *should* expect that prior concepts will continue to show up in later assignments and exams.

### Assessment Types and Frequency

* **Module Activities (Lectures & Practice):** 47 total (15 modules with videos/practice, 2-5 each module)
* **Module Quizzes:** 16 total (one per module, plus a refresher quiz)
* **Module Skill Builders:** 15 total (one per chapter)
* **SPSS Labs:** 5 total
* **Exams:** 2 unit exams & 1 final exam

### Module Activities

Each module contains several (usually between 2 and 5) lecture videos; there are questions embedded within the videos that you need to answer. The intention of the videos and embedded questions is that you regularly engage with the course material. The lecture videos comprise the much but not all of the content you need to learn in this class; you should also read the assigned readings and complete practice activities when they are assigned.

### Module Quizzes

Each module contains an open-note quiz with mostly multiple choice or matching type questions (and occasionally some other question types). Quizzes contain information from both the lectures and the readings, and they primarily focus on conceptual understanding. Quizzes will have about 5 or 10 questions and will have a 15- or 30-minute timer, respectively (depending on the number of questions; 3 mins per question). Therefore, when you open the quiz, you should be prepared to take it (e.g., having studied, taken notes). Quizzes will open *after* you have completed the module activities.

After completing your first attempt, you’ll see which questions you got wrong on the first attempt, and you will have one re-attempt at any incorrect questions. Your recorded score will be the average of the two attempts. For example, if you scored a 60% (6 out of 10 correct) on a first attempt, the second attempt would present you with the 4 questions you got wrong. If you get three correct on the second attempt, the second attempt score would be 90% (9 out of 10), so your score recorded for this quiz would be 75%. Your recorded score will never go down as a result of a second attempt.

I encourage you to use these quizzes as a way to assess your knowledge of the course content and direct your studying efforts before the next exam. However, you should know that the module quizzes are *not* “practice exams,” and the questions that are on the quizzes will *not* be verbatim on the exams (in part because exams also include short answer, computation, and other question types, as well as a further emphasis on application/interpretation). Therefore, your success on the exams depends on how well you understand and can apply the course content – not on how well you’ve memorized questions from the quizzes.

### Module Skill Builders

The Skill Builder assignments are your opportunity to practice the concepts discussed in each module’s lectures. Two things to know about these assignments: (a) we designed them to be closely aligned with the textbook chapters, so there are topics included that are in the textbook but not in lectures [be sure to read the chapters!] and (b) these assignments are more mathematical in nature. These assignments can be completed in a lower-pressure environment because they are not timed or recorded; it is in your best interest to use these assignments to support your learning (e.g., reflecting on what you know well and what you still need to learn) rather than looking up answers or using AI tools to complete them.

You will have multiple attempts to correctly answer a question on MyOpenMath. Many of the questions have three different versions, and you will have two tries for each version of the question. If you submit an answer and get part of it wrong on your first try, you can attempt just the incorrect part again. If it’s still incorrect on the second try, you can view the answer key and use the “Get a similar question” button to generate a new version with different numbers, again with two tries. Some questions (e.g., multiple choice) have only one version, but you still get two tries.

You have 14 late passes that can be used on Skill Builder assignments throughout the semester (i.e., you can use one for each assignment if you need to), which will add 72 hours to the due date. You do not need any special permission to use a late pass; please just use them as needed. You do need to use the late pass before the due date, so if you anticipate needing more time on an assignment, you should add the late pass in advance. [This quick video](https://www.youtube.com/watch?v=dpyP2_wEadI) explains how to use a late pass in MyOpenMath; if it's your first time using a late pass, I would suggest watching the video because the steps are not entirely straightforward. (Do not open an assignment for practice if you plan to use the late pass; once you've submitted your graded attempt, you will still have unlimited practice attempts available.)

### SPSS Labs

### SPSS & Interpretation Labs serve to provide you with an opportunity to apply the course material. In the beginning of the semester, these assignments will focus on foundations (e.g., applying foundational concepts, using software); later in the semester, these assignments will be more like completing full sets of analyses, focusing on real research scenarios, and computing and interpreting results of statistical tests. Five labs will be assigned throughout the semester, two in Unit 1, one in Unit 2, and two in Unit 3.

### To complete SPSS & Interpretation Labs, you will access the assignment through Gradescope. You do not need to request a Gradescope account; you will be able to automatically access it through your KSU D2L account. Please see the instructions and tips on D2L for details (use the Assignments tab on the left course navigation bar). Give yourself plenty of time to complete the SPSS & Interpretation Labs, assuming that you will encounter technical or software challenges. Each time you complete a lab, you will be doing something new in SPSS, so please carefully follow the instructions.

### Exams

There will be two unit exams and one final exam. All exams, including the final exam, will be administered through D2L. Each exam will be open only during the time listed on the schedule, and you can complete them at any time while they’re open. Once you start an exam, the timer will start, so you should only open an exam if you are ready to take it.

You are allowed a one-page printed or handwritten exam guide while taking the exams; it can be no more than 8.5” x 11” maximum, and you can use both the front and back sides. Creating your own study guide is a great way to reflect on the content and skills you have already mastered and see if there are other areas that you need to focus on in more detail. Using an exam guide created by someone else or an AI tool does not prompt the same reflection, so these may not be used. You can include as much detail as you’d like, including details like formulas, which *will not* be provided on the exam. If you need reference tables (like the *z*-table, *t*-table, *F*-table, etc.), they *will* be provided on the exam. The only limitations for the exam guide are the size and page limits and that it must be created by you; this means no copying/pasting lecture slides, sharing exam guides, using a previous student’s exam guide, etc.

You are permitted and encouraged to study together and to seek tutoring or help studying *prior to the exam*. However, you are expressly *not* permitted to work together or seek or give advice or assistance (other than from the instructor) on the actual exam. All exam guides and exam submissions must be your own work.

After completing your exam first attempt, you’ll be able to see which multiple choice, fill-in-the-blank, and computation questions you got wrong on the first attempt, and you will have one re-attempt at any incorrect questions. The re-attempt must be completed during the period that the exam is open. Your recorded score will be the average of the two attempts. Just like with quizzes, your recorded score will never go down as a result of a second attempt.

#### Final Exam

The final exam will be cumulative; approximately a third of the final exam context will be the same concepts covered on Exams 1 & 2 (although different questions, scenarios, etc.) and the remaining two-thirds will focus on the last section of the course. It will cover conceptual knowledge, application, and interpreting results (e.g., written, numerical, software output).

# License

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