

# Research Methods in Cognitive Science

Summer Session - 2021

07/26/2021 - 08/18/2021

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**Instructor:** Dr Deborah J. Aks

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Online Sessions Tues & Thurs: 6 to 7:45pm (in Zoom)

**Online Office Hours:** Tues & Thurs: 8 to 8:55pm

To ensure that I am online during office hours, please let me know in advance either by email or in our online meeting that precedes office hours.

## Course Overview

In this course, we will learn about scientific ways of thinking, and fundamental research methods used to study cognition, as well as the world around us. To accommodate remote-learning, the bulk of the course will be done asynchronously with assignment and materials available on-line. The online units will step you through background material that will be used in doing the assignments.

We will also have a synchronous component to preserve the human element, give everyone the opportunity to interact & to offer alternative activities to those described in the online materials. So as not to penalize students who will have challenges attending the synchronous online meetings, your grade will be based on the asynchronous activities in our course. Synchronous activities will mostly reinforce materials that will be on-line, serve as Q&A for students with questions & give us all an opportunity to interact in a way that's closest to in-person.

**WHAT WILL YOU LEARN IN THIS COURSE?** [1] how to think critically, in general & in a scientific context; [2] how to improve your digital & scientific literacy; [3] how to think & write analytically about cognitive science, and general topics; [4] how to find and read scientific articles; [5] how to synthesize scientific results; [6] how to evaluate descriptive and inferential statistics; [7] how to evaluate scientific reliability and validity; [8] how to evaluate alternative research hypotheses; [9] how to act ethically as a cognitive scientist; [10] how to create and interpret informative scientific tables, figures, and charts; [11] How to set-up a research a research project. [12] how to communicate engagingly through written & oral presentations

## COURSE OBJECTIVES

After successfully finishing the course, you'll be able to:

[1] find, read, and understand scientific articles and synthesize scientific results;

[2] effectively communicate ideas, do critical evaluation, and research through analytic writing and engaging narrated presentations;

[3] think critically, examine links between method and results, consider alternative explanations, and knowledgeably consume research;

- [4] generate testable hypotheses and design psychological research using different methods, data collection tools, and analysis techniques;
- [5] correctly interpret and convey statistical results via text, tables, and graphs;
- [6] use key principles of science, including use of evidence, scientific reliability and validity, and fair and thorough evaluation of research inside and outside the classroom;
- [7] understand that ethical principles, behavior, and decision-making pertain to all aspects of the research process; and
- [8] identify how psychological science can inform societal practices policies, review, and apply what you learn.

**HOW WILL I LEARN IN THIS COURSE?** The pedagogy of this course is driven by empirically proven principles of learning, including the principles of active learning, which is more beneficial than passive learning, and frequent incremental practice, which is more beneficial than sporadic practice. Therefore, in this course, you will acquire skills every day by completing incremental assignments across the term. You will be expected to engage with the course, and with your peers, daily (via online discussion, including synchronously text-based chat). There are NO timed exams in this course, and you will NOT need to purchase a textbook. All course materials will be available in Canvas.

On each of the course's assignments, you can earn the following points: 3 points: If you completed the assignment before its due date AND your INITIAL assignment fulfilled ALL the requirements. 2 points: If you completed the assignment before its due date BUT your INITIAL assignment didn't fulfill all the requirements. However, you corrected your INITIAL assignment to fulfill ALL the requirements ANYTIME before one week after the due date. 1 point: If you didn't complete the assignment before its due date BUT you did complete the assignment before one week after the due date. OR if you completed the assignment before its due date BUT your INITIAL assignment didn't fulfill ALL the requirements AND you didn't correct your INITIAL assignment to fulfill ALL the requirements ANYTIME before one week after the due date. 0 points: If you still haven't completed the assignment one week after the due date. Your final course grade will be the percentage of points you earn from the available **75** total points, using the grading scale below:

A+ ..... 94.00 - 100.00%  
A .... 89.00 - 93.99%  
B+ ....84.00 - 88.99%  
B ..... 79.00 - 83.99%  
C+.....74.00 - 78.99%  
C ..... 69.00 - 73.99%  
D ..... 60.00 - 69.99%  
F.....<59.99%

### **HOW CAN I DO WELL IN THIS COURSE?**

**First**, work on the course every day. The best way to acquire any skill is to practice every day. Similarly, the best way to do well in this course is to practice (i.e., work on the course) every day. In other courses, you might have been able to hang back and then cram in a lot of work at the end of the term. A hang-back strategy will NOT work in this course. Therefore, the **second** way to do well in this course is to keep up. You will have **3 days** to complete each assignment. You will also have a **3-day** extension after each assignment is due to complete the assignment late or to correct any errors you made in your initial assignment.

But after **3 days** of regular completion time and after the **3 day** extension, you will no longer be able to complete the assignment. The opportunity will be gone, just like in real life.

Therefore, the **third** way to do well in this course is to always work ahead. Your working ahead is the best way to avoid the consequences of any unexpected mishap.

**You will need to complete 10 of the 14 assignments linked to the 14 Units below. Each assignment will have multiple components. These will be available on July 26th in Canvas.**

UNIT #1 How to Think Critically about Life

UNIT #2 How to Read Carefully the General Media (and Improve Your Digital Literacy)

UNIT #3 How to Write Analytically about General Topics

UNIT #4 How to Think Critically about Psychological Science

UNIT #5 How to Find and Read Psychological Science

UNIT #6 How to Synthesize Psychological Science

UNIT #7 How to Evaluate Descriptive and Inferential Statistics

UNIT #8 How to Evaluate Scientific Reliability and Validity

UNIT #9 How to Evaluate Alternative Research Hypotheses

UNIT #10 How to Act Ethically as a Psychological Scientist

UNIT #11 How to Design, Administer, and Analyze the Results of Reliable and Valid Online Surveys

UNIT #12 How to Interpret and Create Informative Tables, Figures, and Charts

UNIT #13 How to Communicate Engagingly through PPT, Video, and other Presentation Media

UNIT #14 How to Look Backward (Review What You've Learned) and Forward (Apply What You've Learned)

#### HOW MUCH TIME DO I NEED TO SPEND ON THIS COURSE?

Since this is a 3 credit course which typically takes 135 hours (= 3credits x 45 hours), you are expected to work on this course an average of 5 HOURS per DAY, during the 3 & 1/2 weeks of this course. You should NOT register for this course if you will not be able to spend 5 hours a day, working on only this course, during the course's 14 Units.

**STUDENT ETHICS** Acts of academic misconduct are taken seriously. Such acts diminish the educational experience for all involved – students who commit the acts, classmates who would never consider engaging in such behaviors, and instructors. Academic misconduct includes, but isn't limited to, cheating on assignments, sabotaging the work of classmates, plagiarizing the work of classmates or published sources, and assisting fellow students in acts of misconduct. For detailed information on how to avoid plagiarism, see this link.

I am genuinely interested in each student succeeding in this course. If you encounter any barriers to your success, please let me know. I'm available by email [debaks@rutgers.edu](mailto:debaks@rutgers.edu)

#### HOW CAN I TAKE ADVANTAGE OF THE FLEXIBILITY ACCOMMODATION THAT IS BUILT INTO THIS COURSE?

This course is based on the principles of Universal Design, which prescribes that instructional accommodations should be built into the environment and available to all students (just like elevators and curb cuts) rather than needing to be requested ex post facto or available to only some students.

The course offers many grading opportunities, rather than only three or four, and the course is highly structured with explicit due dates. These accommodations are all built into this course to facilitate all students' success. Most importantly, the course has a built in flexibility accommodation available to all students. All students have the opportunity to work ahead; to turn work in late (with a small penalty); and to miss occasional assignments and still earn a good final grade.

Flexibility is built into this course to aid all students, including students with religious conflicts, care-giving responsibilities, unpredictable work schedules, and student athletes -- everyone. To take advantage of the flexibility accommodation, you must do three things. First, take advantage of the opportunity to work ahead. The entire course is available a few days before the first assignment is due; each Discussion Board opens 3 days before it is due. Take advantage of the opportunity to work ahead and complete as many assignments in advance as you can. If, for example, you're a student with a chronic health condition, the work you do in advance when you're feeling well will be like money in the bank for the times later in the term when you might not be feeling well. Second, take advantage

of the opportunity to turn in work up to 3-days late, with a small penalty. All students can turn in some assignments late and still earn a good final grade. It is unnecessary to ask for an extension on any assignment because all students have a 3-day extension on every assignment. Third, take advantage of the opportunity to miss an assignment if needed. You'll see that all students can receive top scores by completing 10 of the 14 assignments.. Flexibility is built into this course because we know how important it is for everyone to have a built-in flexibility accommodation. Take advantage of it!

Additional info (in progress):

- We will abide by the "[Seven Principles of Good Practice in Undergraduate Education.](#)"
- [Student Contract](#)
- [Rutgers Current Academic Integrity Policy & Student-Wellness Services](#)