RESEARCH METHODS: HUMAN BEHAVIOR

PSYC UN1420 - 4 Points, Fall 2026
Students must register for both UN1420 and one of the lab sections of UN1421.

Lecture: Thursday, 12:10 – 2:00 PM, TBD
Lab Section 1: Thursday, 4:10 - 6:00 PM, TBD
Lab Section 2: Thursday, 4:10 - 6:00 PM, TBD

Prerequisites:
- PSYC UN1001 (Science of Psychology), or PSYC UN1010 (Mind, Brain & Behavior), or an equivalent introductory psychology course with instructor permission
- An introductory statistics course (e.g., PSYC 1610, STAT 1001, 1101, or 1201)

Corequisite: PSYC UN1421 – 0 points
PSYC UN1421 is the required lab section for UN1420.
Note: In semesters when space is limited, priority for enrollment will go first to Psychology majors, post-bac students in the Psychology Certificate program, and Neuroscience & Behavior majors. Attendance at the first class and lab is essential.

Instructor: Ana Alexandrescu, Ph.D. (she/her/hers)
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Student Hours: TBD

Teaching Assistants and Lab Instructors:
TBD
Email:
Student Hour: TBD

ROLE IN THE PSYCHOLOGY CURRICULUM
This course is designed primarily to introduce students to experimental methods in psychology, and as such fulfills the following requirements:

- The Laboratory (Research Methods) requirement of the Psychology major, and of the Psychology Post-Bac certificate program
- The P3 (Research Methods / Statistics) requirement of the Neuroscience and Behavior major

This course may not be used to fulfill the Group 1 requirement. It is considered overlapping with the other Research Methods courses in the Psychology Department (i.e., UN1400s), so if you have taken one of those courses already, you should not take this course – you may not apply more than one course numbered in the 1400s toward the major or concentration.

COURSE DESCRIPTION & REQUIREMENTS

This course is an introduction to research methods employed in the study of human behavior in psychology with a focus on studies in the areas of learning and memory. Students will gain experience in the design and conduct of research, including ethical issues, observation and measurement techniques, interpretation of data, and preparation of written and oral reports.

Research methods and experimental design are the backbone of the study of psychology, and the reason we classify it as a scientific discipline. This course is designed to introduce students to the basics of conducting research into questions of human behavior. This goal is shared by each of the Experimental Psychology courses at Columbia (i.e., PSYC 1420, 1450, 1455, and 1490). Each of these courses covers the same general principles of hypothesis testing, methodology, experimental design, data analysis & interpretation, and theory building. The differences in these methods courses are the perspectives from which each approaches those same topics; in this section of PSYC 1420, our focus is, broadly, on the cognitive research supporting the scholarship of teaching and learning. As such, we'll be examining various areas of research that have greatly impacted how we teach and study.

Both an introductory psychology course and statistics course are prerequisites for this course. Students are expected to be familiar with descriptive statistics, t-tests, correlation, regression and ANOVA. Without some background in statistics, it would be very difficult to get the most out of this course. The basic statistical methods necessary to understand and conduct the data analysis will be reviewed.

We will introduce and use R as a tool for statistical analysis. You are not expected to have any prior knowledge of R or any other statistical programming language. R is useful because it is widely used and freely available. It is only a tool, not a goal in itself. Note, this is not a full course in R, but rather a general/gentle introduction. You will not become an R programmer by taking this course.

COURSE STRUCTURE

This course has a lecture component and a lab component. Both are required. Generally speaking, the lecture and lab components will be related so that the concepts introduced in lecture will be important for lab and reinforced by the lab experience.

LEARNING OBJECTIVES

After successfully completing this course, you will be able to:

1. Understand and apply basic research methods and experimental design principles.
2. Integrate statistics into the experimental design process.
3. Analyze, illustrate, and interpret experimental results using the statistical software package R.
4. Critically evaluate the experimental design and results reported in popular science and primary research articles.
5. Collaborate with your peers to design a research study motivated by theory.
6. Effectively report research findings in both oral and written form.

READINGS

Required Textbook:

Passer, M. W. (2021). Research Methods: Concepts and Connections, 3rd ed. New York: MacMillan. ISBN: 978-1-31918-451-3.
The book is available as a textbook rental, as a looseleaf edition or as an e-book.

The textbook for this class is recommended as a supplement to the lecture slides, however you will not be tested on any terms that we don't cover in class. All other readings (empirical papers, typically) are required reading. Unless otherwise indicated, each chapter listed in the reading assignments in the course schedule below refers to this text and should be completed before class.

The **other required readings** for this class will consist mostly of empirical papers (peer-reviewed published writeups of psychology studies), from which we'll be drawing the examples we use in class to discuss various aspects of experimental design. Each of these papers will be made available on Canvas as a PDF.

GRADING SCALE

A+ = 99 -100% **A** = 93-98.99% **A-** = 90-92.99% **B+** = 87-89.99% **B** = 83-86.99%
B- = 80-82.99% **C+** = 77-79.99% **C** = 73-76.99% **C-** = 70-72.99% **D** = 60-69.99 **F** < 60%

ASSESSMENTS

Participation	6%
Midterm Exam	15%
Final Exam (cumulative)	20%
2 Media Reports	8%
9 (out of 10) Problem Sets	36%
Group Project Presentation	5%
Group Project Research Paper	10%

	100%

Class participation (6%): You are expected to attend and be on time for each class. If you cannot make it to class for an excusable reason (e.g., medical reason), you are expected to contact me by email within 24 hours of class time to explain your absence. Expected absences due to religious observation need to be communicated to me during the first two weeks of class.

Your participation in every lecture and lab (your willingness to engage in discussions and in-class activities and to ask and answer questions about course material) will greatly contribute to your understanding of the material and to your overall success in the course.

Lab attendance: Labs are your time to get hands on experience developing research ideas and conducting studies. You must be present and able to actively participate. Unexcused absences

will impact your grade. Missing lab will only be excused in cases of serious medical or personal emergency.

Exams (15% + 20%): There will be two in-class, closed-book exams consisting of multiple choice, fill-in-the-blank, true/false, and short-answer questions. The material tested on exams will be derived from lecture material and from the assigned textbook readings. The final exam will be cumulative.

Media reports (2 x 4%): You will be asked to write 2 media reports based on popular media and primary scientific articles of your choice in which you discuss, analyze, and critique the information presented in the articles through the lens of the knowledge and critical thinking you acquire in this course.

Lab problem sets (9 x 4%): We will have labs on Thursday, 4:10 - 6 PM (unless otherwise noted in the course schedule). The goal of each lab will be to (1) allow you to practice, combine, and question the concepts you've learned about in lecture; (2) provide practical experience applying experimental design, analyzing data sets, and interpreting and presenting research results; and (3) teach you the basics of the statistical software R. There will be one problem set associated with most labs (10 problem sets (PS 1-10). Your lowest problem set will be dropped. Although collaboration on completing the problem sets is allowed (and encouraged), each student should submit their own answers on Canvas. These will be evaluated based on completion and accuracy. The due date of each problem set will be the following Monday, 12:00 PM. In 3 of the labs, we will discuss a primary research paper and use it to complete that lab's problem set. You will need to read the papers before class and come prepared to apply what you learned in the course to the information in the papers.

Group project presentation and research paper (5% + 10%): At the end of the course, you and two or three of your classmates will present a group project on which you have worked throughout the course. You and your teammates will work in collaboration both in and outside the lab to propose and conduct a simple research project, using your recently developed experimental design and analysis tools. We will devote several lab sessions to your group work on developing, executing, and analyzing your project. Each group member will present and defend in an oral presentation the part of the project they worked most on (5%). Additionally, each group member will write a research paper based on their group project (10%).

Assessment submission and grading criteria: Written assignments will be posted and will need to be submitted through Canvas. Grading rubrics will be provided to guide you on the specific expectations and evaluation criteria for written and oral presentation assessments.

Missed / late assessments policy: Problem sets associated with unexcused lab absences will not be accepted and will receive a zero. All assignments submitted after the posted deadline on Canvas will receive an immediate penalty of 10% for every 24 hours of lateness. Assignments will not be accepted and will receive a zero after more than 5 calendar days past the deadline.

WELLNESS STATEMENT

It is important for undergraduates to recognize and identify the different pressures, burdens, and stressors you may be facing, whether personal, emotional, physical, financial, mental, or academic. We as a community urge you to make health, sanity, and wellness--your priority throughout this term and your career here. Sleep, exercise, and eating well can all be a part of a healthy regimen to cope with stress. Resources exist to support you in several areas of your life, and we encourage you to make use of them.

https://health.columbia.edu/content/counseling-and-psychological-services

http://blogs.cuit.columbia.edu/nightline/

https://universitylife.columbia.edu/student-resources-directory#health

ACADEMIC ACCOMMODATIONS

In order to receive disability-related academic accommodations for this course, students must first be registered with their school Disability Services (DS) office. Detailed information is available online for both the Columbia and Barnard registration processes.

ACADEMIC INTEGRITY

As we are all members of an academic community, it is up to each of us to uphold the academic integrity necessary for our collective development. You can find detailed definitions and examples of this integrity in Columbia University's Guide to Academic Integrity. In short, violations of academic integrity are treated incredibly seriously by your teaching team and the University.

From the Faculty Statement on Academic Integrity -
https://www.college.columbia.edu/academics/integrity-statement

"The intellectual venture in which we are all engaged requires of faculty and students alike the highest level of personal and academic integrity. As members of an academic community, each one of us bears the responsibility to participate in scholarly discourse and research in a manner characterized by intellectual honesty and scholarly integrity. . . . In practical terms, this means that, as students, you must be responsible for the full citations of others' ideas in all of your research papers and projects; you must be scrupulously honest when taking your examinations; you must always submit your own work and not that of another student, scholar, or internet agent."

Policy on the use of AI in course work:

You may use AI programs (Google AI, ChatGPT, Claude, etc.) to help generate ideas and brainstorm. However, you should note that the material generated by these programs may be inaccurate, incomplete, or otherwise problematic. Beware that use may also stifle your own independent thinking and creativity. You may not submit any work generated by an AI program as your own. If you include material generated by an AI program, it should be cited like any other reference material (with due consideration for the quality of the reference, which may be poor). Passing off large language models (ChatGPT, Claude, etc.) responses as your own is a violation of academic integrity.

If you have any question about whether or not something is acceptable in your written work, please ask a member of the teaching team.

VALUES STATEMENT

This course will promote and embrace a supportive, respectful, and open-minded climate free of harassment and unfair treatment. Bias-motivated actions or discriminatory behaviors towards groups based on social identities including race, ethnicity, country of origin, religion, gender identity/expression, sexual orientation, age, or (dis)ability status will not be tolerated.

ADDITIONAL RESOURCES FOR STUDENTS:

Columbia University Writing Center	https://www.college.columbia.edu/core/uwp/writing-center
Tutoring Service	https://www.cc-seas.columbia.edu/csa/tutoring
Health Services	https://health.columbia.edu/
Go Ask Alice! (answers to health questions)	https://goaskalice.columbia.edu/
Counseling and Psychological Services (CPS)	https://health.columbia.edu/content/counseling-and-psychological-services For appointments, call 212-854-2878. For after-hours assistance, call 212-854-9797 or contact Public Safety at 212-854- 5555.
Office of Disability Services	Columbia - https://health.columbia.edu/content/disability-services Barnard - https://barnard.edu/disabilityservices
Office of University Chaplain	http://ouc.columbia.edu/

Course Schedule

This schedule is subject to change and will periodically be updated on Canvas. It is your responsibility to attend class and check Canvas so that you will be aware of any changes in the course.

Date	Class	Lecture Topics	Lab Activities	Readings and *HW* due
9/10	1	Course Intro Science, Psychology, and You The Scientific Method	Class Experiment	Course Syllabus & Schedule
9/17	2	The Scientific Method Cont. Generating Research Hypotheses	Hypotheses Problem Set PS1 Intro to R – Organizing class experiment data	Ch. 1, 2
9/24	3	Measuring and Manipulating Variables	Variables PS2 R Exercise	Ch. 4
10/1	4	Sampling and Generalizability	Group Project Topic Brainstorming PS3	*Group Project Proposal*
10/8	5	Experimental Control Subject Designs	Experimental Control & Design PS4	*Media Report 1*
10/15	6	Validity and Ethics	Paper Discussion & R Exercise PS5	Ch. 3, 10, Appendix B *Read Paper 1-TBD*
10/22	7	Midterm Exam	No Lab	
10/29	8	Descriptive Methods: Correlational Research	Correlation & Regression R Exercise PS6	Ch. 5 *Media Report 2*
11/5	9	Descriptive Methods: Case Studies & Survey Research	Paper Discussion & Activity PS7	Ch. 6, 7 *Read Paper 2-TBD*
11/12	10	Experimental Methods: Single-Factor Designs	T-test & ANOVA R Exercise PS8	Ch. 8
11/19	11	Experimental Methods: Factorial Designs	Paper Discussion & Activity PS9	Ch. 9 *Read Paper 3-TBD*
11/26	No class	No class	No class	
12/3	12	Communicating Research Results	Group Project Data Visualization – R PS10	Appendix A
12/10	13	Replicability & Open Science	Group Project Presentations	*Group Project Research Paper Due 12/13*
12/17	14	Final Exam (Cumulative) (Date & Time TBD)	No Lab	