



Statistical Methods and Research Design

Graduate School of Applied and Professional Psychology (GSAPP)
Rutgers University, New Brunswick
18:844:506:01, Spring 2025

- Instructor:** Robert W. Isenhower, Ph.D., BCBA-D (he/him)
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Office Phone: (848) 932-4500
- Time/Place:** Th 6:15-8:45 PM: Nelson Classroom [NH-D340](#)
- Office/Hours:** Office: DDDC, 151 Ryders Lane, New Brunswick, NJ 08901
Hours: Tuesday 1-2 PM (DDDC), Thursday 5-6 PM (Nelson), and by appointment ***The instructor will make every reasonable effort to meet with students whenever necessary. Meetings may be held over Zoom or in-person. Please email me to schedule.
- Purpose:** This course provides a comprehensive introduction to quantitative research methods in psychology, emphasizing the roles of research consumer and producer. We will explore various research designs and their underlying logic, including experimental, quasi-experimental, correlational, cross-sectional, and longitudinal designs. Students will critically evaluate research articles, examining their designs, validity, analyses, and conclusions to deepen their understanding of research practices. Students will also learn to apply statistical techniques (e.g., t-tests, ANOVA, regression) and interpret statistical results utilizing SPSS.
- Learning Outcomes:** At the end of this course, you will be able to:
1. Recognize the importance of research in the development of scientific knowledge.
 2. Identify ethical principles that must be adhered to throughout the research process and identify issues conducting research with diverse groups.
 3. Demonstrate a basic understanding of the steps underlying research development, including developing research questions, formulating hypotheses, operationalizing variables, and choosing study design.
 4. Identify the basic concepts of research methodology and design, discriminate between experimental, quasi-experimental, non-experimental, cross-sectional, and longitudinal designs, and determine the implications of using each.

5. Identify the scale of measurement of a variable and the most appropriate methods for presenting and interpreting data for that variable, both in terms of visual representations and descriptive statistics.
6. Select, conduct, and interpret the appropriate statistical test (from among those covered in the class) for a given research question and report the results, including effect size measures, using APA reporting guidelines.
7. Use a statistical software package (i.e., SPSS) to create and modify data files, generate graphs, and obtain descriptive and inferential statistics.

Text/Software: Coolican, H. (2024). *Research methods and statistics in psychology*. Routledge. 8th Ed.

SPSS software will be used during the second half of the semester. SPSS software is [free](#). You will need access to a laptop computer to use SPSS during the second half of the semester.

Assessments: *Exams*

There are two exams in this course, one around the middle of the semester (about Week 7) and one at the end of the semester.

Exam 1 comprises mostly **multiple-choice** and **short answer** questions and will take place during class. Test material will be based on the assigned readings and the lectures.

Exam 2 will be a practical take-home exam comprised of **short answer** and **applied** questions based on assigned readings, lectures, and the statistical analyses we have used during the semester.

Any make-up exams must be scheduled in advance of the exam date and may follow a different format.

Homework Questions

During the first half of the semester, questions about the readings are posted on Canvas. Answer these questions and prepare to discuss them at the beginning of and/or during class. Questions are to be worked on individually. These questions are considered homework and are to facilitate class discussion, they are due **prior to the beginning of class**.

During the second half of the semester, questions related to the statistical procedures we will use will follow each in-class SPSS lab assignment. Questions are to be worked on individually. Complete each assignment **prior to the next class**.

In-Class Activities

Most weeks we will engage in an in-class activity to help bring some of the course concepts to life and facilitate progress on your group project. You **must be present** to earn credit for each in-class activity.

Research Article Analyses

During the semester you will analyze **two peer-reviewed quantitative** research articles in an area of applied psychology which you are interested in.

These assignments will build on each other based on the topics we will cover in class. During the **first** analysis we will focus on:

- Research Context
- Research Design
- Sampling Methods
- Operationalization of Variables
- Ethical Considerations
- Conclusions

During the **second** analysis you will also examine:

- Implementation of Statistical Tests
- Effect Sizes and Practical Significance
- Presentation of Results
- Study Limitations and Alternative Explanations
- Reproducibility and Transparency

APA Citation Style: All papers MUST be written using APA style (7 ed.).

Important Note: Plagiarism essentially means that you cannot use the words and ideas of another person without giving them credit. Therefore, “quotation marks” should be used to indicate the exact words of another. That said, exact quotes should be kept to a minimum. Rather, each time you paraphrase another author you will need to credit the source in the text. If you have any questions about what constitutes cheating or plagiarism, please see me. Students who plagiarize any material will earn a grade of F for the course.

Grading:

Assessment Tool (Category)	Percentage
Midterm Exam	20%
Practical Take-Home Final	20%
Homework Questions	15%
(In-class) Activities	15%
Research Article Analysis (x2)	30%
Total	100%

Standards:

The following grading standards will be used in this class:

Grade	Description	Numerical Equivalent
A	Outstanding	89.5-100 (4.0)
B+	Intermediate grade	86.5-89.4 (3.5)
B	Good	79.5-86.4 (3.0)
C	Grades of <u>C</u> do not count toward graduation	69.5-79.4 (2.0)
F	Failing	69.4 or below (0.0)
INC	Incomplete	

All MAP and Graduate Certificate in ABA students must achieve a grade of B or better and maintain a GPA of 3.0, or academic remediation will be enforced.

- Timeliness:** Be sure to pay close attention to deadlines. Late work may be accepted with a serious and compelling reason and approval. However, assignments that are submitted after the due date may be subject to a 10% penalty per day (with a 24-hour grace period).
- Technology:** If students expect to send or receive urgent e-mails, texts, or calls during class, their needs should be communicated to and approved by the instructor prior to class. All cell phones should be turned off or placed in silent mode. All computing devices should be used only for the purpose of class-related activities.
- Email:** Prompt communication is essential. On weekdays I will try my best to respond to emails within 18 hours. Over the weekend, please allow 24-36 hours for a response.
- GSAPP Diversity:** The Graduate School of Applied and Professional Psychology (GSAPP) at Rutgers University-New Brunswick is committed to diversity, equity, and inclusion (DEI). We view individuals from a variety of backgrounds, lived-experiences, identities, and perspectives across our community members as critical to our threefold mission of world-class education, scholarship, and public service. We aim to honor diversity through a variety of means, such as inclusive groups, events, initiatives, curricula, and our organizational composition. We strive to create and maintain a safe space in which all voices are heard and valued, consistent with Rutgers University's Beloved Community. GSAPP acknowledges the current, historical, and systemic practices that have been used to marginalize and oppress some identities and give power and privilege to others in and beyond the United States. Additionally, we are keenly aware of the destructive effects, including on mental health and personal well-being, of prejudice, stigma, microaggressions, and

violence in all its forms. We engage in a critical examination of our own biases and behaviors, both past and present. We utilize evolving methods to address, incorporate, and celebrate DEI through our scholarship, service, and training of future health service professionals.

- Accessibility:** Rutgers University welcomes students with disabilities into all 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 (<https://webapps.rutgers.edu/student-ods/forms/registration>).
- Integrity:** <http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers/>
- Generative AI:** **Restricted and Cited Use of Generative AI:** Use of generative AI (e.g., ChatGPT, etc.) may be allowed under specific conditions that support student learning outcomes (SLOs), provided its use enhances rather than substitutes for learning. To ensure transparency and accurate assessment of SLOs, students must disclose any Generative AI assistance, allowing evaluations to reflect both their learning and the extent of generative AI usage. Students who use ChatGPT and similar programs improperly are seeking to gain an unfair advantage, which means they are committing academic dishonesty (see above).
- Resources:** <https://gsapp.rutgers.edu/current-students/important-links>
- Title IX:** <http://compliance.rutgers.edu/resources/resources-for-facultystaff>
- Counseling:** Students often experience personal problems or difficulties during the term that may interfere with learning and their daily activities. If you or someone you know needs to talk to someone regarding such personal issues, the University provides free counseling services through the Counseling and Psychological Services (CAPS) and their information can be found at <http://psychologicalservices.rutgers.edu>. There are also useful workshops for general stress management and techniques for promoting mental health. If you have any questions about CAPS or other services, I am happy to speak with you privately.

WEEKLY SCHEDULE

Weeks/Meetings	Topics/Readings	Assignments/Activities
Week 0	Start Here	Discussion Post: Introduce Yourself Syllabus Quiz
Week 1 Jan 23	Introduction: Psychological Science & Research Coolican (Ch 1)	Introductions In-class: Falsifiability of Theories
Week 2 Jan 30	Measuring People; Validity in Research Coolican (Ch 2 & 4)	Homework Questions (HW) 1 In-class: Threats to Validity
Week 3 Feb 6	Experiments, Quasi-experiments, & non-experiments Coolican (Ch 3 & 5)	HW 2 In-class: Matching Research Questions to Designs
Week 4 Feb 13	Methods, Tests, & Measurement Coolican (Ch 6-8)	HW 3 In-class: Building an Attitude Scale
Week 5 Feb 20	Comparison Studies Coolican (Ch 9)	HW 4 In-class: Method Outline
Week 6 Feb 27	Ethical Issues in Psychological Research Coolican (Ch 11) Exam 1 review	HW 5 In-class: Informed Consent
Week 7 Mar 6		Exam 1: In-class
Week 8 Mar 13	Organizing Data & Introduction to SPSS Coolican (Ch 13)	SPSS Lab 1 In-class: Introducing SPSS Article Analysis 1 Due
Mar 20	***Spring Break***	No class
Week 9 Mar 27	Representing Data Graphically Coolican (Ch 14)	SPSS Lab 2 In-class: Graphing Data
Week 10 Apr 3	Frequencies, Distributions, & Significance Testing Coolican (Ch 15 & 16))	SPSS Lab 3 In-class: Distributions and Significance Testing

Week 11	T-Tests	SPSS Lab 4
Apr 10	Coolican (Ch 17)	In-class: T-Tests
Week 12	ANOVA	SPSS Lab 5
Apr 17	Coolican (Ch 22-24)	In-class: ANOVA
Week 13	Correlation & Regression	SPSS Lab 6
Apr 24	Coolican (Ch 19 & 20)	In-class: Correlation & Regression
		Article Analysis 2 Due
Week 14	Factor Analysis & Wrap Up	
May 1	Coolican (Ch 21)	Exam 2: Take-home (assigned)
	Exam 2 Review	
Week 15		Exam 2 Due
May 8		

NOTE: The dates assigned to each topic are approximate. Instructor reserves the right to modify aspects of the course during the semester to better serve the needs of the students.

Rutgers University Mission

As the premier comprehensive public research university in the state's system of higher education, Rutgers, The State University of New Jersey, has the threefold mission of:

- providing for the instructional needs of New Jersey's citizens through its undergraduate, graduate, and continuing education programs,
- conducting the cutting-edge research that contributes to the medical, environmental, social, and cultural well-being of the state, as well as aiding the economy and the state's businesses and industries, and
- performing public service in support of the needs of the citizens of the state and its local, county, and state governments.

Each component of the university's mission reinforces and supports the other two.

As the University of New Jersey®, Rutgers is dedicated to teaching that meets the highest standards of excellence, to conducting research that breaks new ground, and to provide services, solutions, and clinical care that help individuals and the local, national, and global communities where they live.

GSAPP Mission

The mission of GSAPP is threefold: education, research/scholarship, and public service. Its goal is to prepare well-educated, qualified, and competent direct-service psychologists who have a special commitment to direct community involvement and to underserved populations--

professionals who can integrate scientific knowledge with innovation in the delivery of psychological services to individuals, families, groups, and organizations. Professionals receiving a doctoral degree in psychology should be capable of extending psychological knowledge and exhibiting the high level of analytic skills and theoretical understanding needed to use existing and emerging psychological knowledge.

Core Values. We are guided by four core values that are apparent in our learning environment, centers, and clinics:

1. **Academic excellence** in preparing students for careers in clinical and school psychology.
2. Commitment to **social justice** and helping **underserved populations**.
3. **Diversity** of students trained, approaches used, theoretical orientations followed, and populations served.
4. **Knowledge generation and dissemination** using contemporary research approaches.

MAP Statement

The program embraces the mission of the school by offering instruction that has an emphasis on civic and global citizenship, social justice, and cultural diversity. This course of study provides students with the knowledge needed to understand individual and collective behaviors; develop quantitative and qualitative statistical analysis and research design needed to analyze the corresponding physical and environmental contributors to human behavior; and a beginning understanding of the analysis and treatment of behavior problems and disorders.

The MAP degree will prepare students with the requisite theoretical knowledge; critical thinking and problem-solving skills needed to successfully participate in employment or scholastic activities. Students will have opportunities to pursue scholarly activities that prepare them to successfully compete for admissions into doctoral-level psychology and related academic programs and pursue master's level career pathways through available concentration and certificate programs (see examples of concentration areas listed below). In addition to completing the required coursework (36 credits), completion of the MAP degree will be marked by a culminating academic experience—Capstone project (either a research project/presentation (3 credits) and experiential learning activity (6-credit practicum training). In general, students will acquire a knowledge base grounded in psychological theory and experiential learning (research or practicum) designed to further advance their personal and professional career development.