

Statistical Methods and Research Design

Graduate School of Applied and Professional Psychology (GSAPP)
Rutgers University, New Brunswick
18:844:506:01, Spring 2024

- Instructor:** Robert W. Isenhower, Ph.D., BCBA-D (he/him)
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Office Phone: (848) 932-4500
- Time/Place:** T 3:35-6:05 PM: Nelson Classroom [NH-D340](#)
SPSS lab: [ARC 121](#)
- Office/Hours:** Office: DDDC, 151 Ryders Lane, New Brunswick, NJ 08901
Hours: Tuesday 1-3 PM and by appointment
***The instructor will make every reasonable effort to meet with students whenever necessary. Meetings maybe held over Zoom or in-person. Please email me to schedule.
- Purpose:** This course provides a comprehensive introduction to quantitative research methods in psychology from both the role of research producer and research consumer. Students will be guided through various research designs and their logics, such as experimental, quasi-experimental, correlational, cross-sectional, and longitudinal designs. Students will also learn how to utilize various statistical techniques (e.g., t-tests, ANOVA, multiple regression) with an emphasis on SPSS and interpreting statistical results.
- 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 need to be adhered to throughout the research process and identify issues conducting research with diverse populations.
 3. Demonstrate a basic understanding of the steps underlying research development, including the development of research questions, formulation of hypotheses, operationalization of variables, and the choice of 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 use of descriptive statistics.
6. Select, conduct, and interpret the appropriate statistical test (from among those covered in the class) to be used for a given research question, and report the results, including measures of effect size, using APA reporting guidelines.
7. Use a statistical software package (e.g., SPSS) to create and modify data files, generate graphs, obtain a range of descriptive and inferential statistics.

Text/Software: Coolican, H. (2018). *Research methods and statistics in psychology*. Routledge.

SPSS software will be used during the second half of the semester. Instructions for lab and virtual lab use, forthcoming.

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 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

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. Because these questions are to facilitate class discussion, they are due **prior to** the beginning of 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.

Group Research Proposal

Each group (of about 4) is required to complete an 8–10-page paper (double-spaced) outlining a hypothetical applied psychological study. Because this is a proposal, you will use future tense in your writing.

Components of the paper:

1. Introduction
 1. Purpose/Background: Provide a brief description of the purpose of the proposal.
 2. Be sure to describe the relevant literature on your topic (at least 8 peer-reviewed sources from the last 10-20 years).
 3. State your hypothesis/research question.
2. Method
 1. Participants, Setting, and Materials: Where you will run the student and with whom? What equipment will you need to complete the study?
 2. Measurement: What is/are your operational definition(s)? How will you measure it/them (direct observation, survey, questionnaire, interview)?
 3. Research Design: Which design (e.g., experimental, cross-sectional) and why?
 4. Procedure: How exactly will you conduct sessions?
3. Results
 1. Summary of findings
 2. Justification and explanation of statistical analysis used.
 3. Graph(s) of hypothetical results.
4. Discussion
 1. Potential conclusions related to literature.
 2. Limitations and future directions
5. References
6. APA style & grammar

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.

Presentation

Each group will deliver a 15–20-minute presentation summarizing their proposal to the class. All members must participate. Students should

use PowerPoint or Google slides for the presentation and be prepared to discuss. Presentations will occur in class during week 14.

Grading:

Assessment Tool (Category)	Percentage
Exams (x2)	40%
Homework Questions	15%
(In-class) Activities	15%
Group Research Proposal	20%
Group Presentation	10%
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/>
Students who use ChatGPT and similar tools on assignments without permission, or who use them in improper ways, are violating the academic integrity rules of the University. Students who use ChatGPT and similar programs improperly are seeking to gain an unfair advantage, which means they are committing academic dishonesty.

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>. They also offer several 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 Your Values
Week 1 Jan 16	Introduction: Psychological Science & Research Coolican (Ch 1)	Introductions In-class: Group Project Preliminaries
Week 2 Jan 23	Measuring People & Validity in Research Coolican (Ch 2 & 4)	Homework Questions (HW) 1 In-class: Developing a Research Question
Week 3 Jan 30	Experiments, Quasi-experiments, & non-experiments Coolican (Ch 3 & 5)	HW 2 In-class: Considering These Designs
Week 4 Feb 6	Methods, Tests, & Measurement Coolican (Ch 6-8)	HW 3 In-class: Developing Tests and Measures
Week 5 Feb 13	Comparison Studies Coolican (Ch 9)	HW 4 In-class: Considering Other Designs
Week 6 Feb 20	Ethical Issues in Psychological Research Coolican (Ch 11) Exam 1 review	HW 5 In-class: Informed Consent
Week 7 Feb 27		Exam 1: In-class

Week 8 Mar 5	Organizing Data & Introduction to SPSS Coolican (Ch 13)	HW 6 SPSS Lab 1 In-class: Introducing SPSS
Mar 12	***Spring Break***	No class
Week 9 Mar 19	Representing Data Graphically Coolican (Ch 14)	HW 7 SPSS Lab 2 In-class: Visualizing Your Results
Week 10 Mar 26	Frequencies, Distributions, & Significance Testing Coolican (Ch 15 & 16))	HW 8 SPSS Lab 3 In-class: Choosing a Significance Test (Ch 25)
Week 11 Apr 2	T-Tests & ANOVA Coolican (Ch 17 & 22)	HW 9 SPSS Lab 4 In-class: APA Format for Statistics
Week 12 Apr 9	More on ANOVA Coolican (Ch 23 & 24)	HW 10 SPSS Lab 5 In-class: Peer Review
Week 13 Apr 16	Correlation, Regression, & Multiple Regression Coolican (Ch 19 & 20)	HW 11 SPSS Lab 6 Group Paper Due
Week 14 Apr 23	Wrapping Up Exam 2 Review	Group Presentations Exam 2: Take-home (assigned)
Week 15 May 7		Exam 2 Due

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.