

# Research Methods 1: Statistics & Design

Professor Stephen Flusberg

Lab: Tuesdays 12:30-3:30 PM (LIB 1004C)

Lecture: Wednesdays 3:00-6:00 (Nat Sci 1030)

This course will cover the nature of scientific knowledge, how to design and run a psychology experiment, research ethics, and basic statistics. Most importantly, this class will give you powerful new tools for thinking critically about psychological research, and the practical skills needed to scientifically investigate human behavior and the world around you. You will gain hands on experience with data management and statistics software, as well as designing and running experiments, and you will learn what bags of candy can teach us about probability. Psychology majors must earn a grade of at least a C in this class to progress to Research Methods II. This course satisfies the SUNY mathematics general education requirement.

## Course Objectives

- Students will show competence in the following quantitative reasoning skills:
  - Students will show competence in the following quantitative reasoning skills:
  - Interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics;
  - Represent mathematical information symbolically, visually, numerically, and verbally;
  - Employ quantitative methods such as arithmetic, algebra, geometry, or statistics to solve problems;
  - Estimate and check mathematical results for reasonableness
  - Recognize the limits of mathematical and statistical methods
- Learn how to design, run, and analyze observational and experimental psychology studies
- Develop the ability to critically evaluate the science depicted in popular and academic media
- Learn how to use Excel to organize and manage data, and JASP to conduct statistical analyses
- Acquire a conceptually rich understanding of basic statistical concepts and procedures
- Cultivate a rigorous and ethical scientific mindset

### Instructor Contact Information

Prof. Stephen Flusberg  
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### Office Hours

Tues & Weds, 10:00-11:30 AM  
Nat Sci room 2045, (914) 251-6650

### Learning Assistant Contact Info

Marisa Fahey  
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Kiera O'Connell  
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### Office Hours

Fridays, 4:00-5:00 PM  
Natural Sciences 1<sup>st</sup> Floor Lounge

Tuesdays, 3:30-4:30 PM  
Library Group Study Area

No appointment is necessary to attend any office hours. Please use the [Discussion Board](#) on the course Moodle site if you have any basic questions and one of us (or one of your peers) will respond in a timely fashion. If you contact us, we will do our best to get back to you within a 24-hour period, but we will not typically respond to emails after 9:00 PM.

## Course Overview:

This is an advanced psychology course that will include lectures, readings, assignments, exams, and hands-on research activities. There is one 3-hour lab and one 3-hour lecture period each week. Coursework will center on the following elements:

### 1. Attendance & Participation

Attendance for the full class and lab periods is required; if you cannot arrive on time and stay until the end, I would ask that you drop the course. I will post lecture slides on Moodle after class, but they will be difficult to understand if you're not in class. Laptops and similar technology are permitted during lecture for note-taking purposes only (although some research suggests that taking notes by hand may result in better memory for lecture material). Please exercise common courtesy to your instructor and fellow classmates by avoiding the use of distracting applications during class, such as email, web browsing, chat programs, etc. **Four unexcused absences from class or lab will result in an automatic F.** If you know you will be missing class, please let us know ahead of time and provide documentation if possible. Participation in class discussions and activities is required. Questions are a perfectly thoughtful form of contribution; no one is required to be brilliant all the time, especially when it comes to challenging course material. If speaking in class is difficult for you, you may participate in other ways by coming to office hours or posting on the Moodle class Discussion Board. Participation also includes actively engaging with classroom and lab activities.

### 2. Readings

There is no official textbook to purchase for this course. Instead, readings will be drawn from a variety of different sources and will be available to download on Moodle for free. We have also provided a few supplemental resources, which may prove useful, including the open source *Passion Driven Statistics* iBook and the *JASP Student's Guide*. The readings are designed to *complement* the lecture material, and to stimulate your thinking about research methods and statistics in the behavioral sciences. I will lecture on material that is not covered in the readings (and vice versa), and sometimes you will read something that won't come up in class for a few weeks. It is your responsibility to check Moodle frequently and to download and read the assigned readings *before* coming to class.

### 3. Computer Software

Since this is a research-intensive methods course with a weekly lab, you will probably not be surprised to hear that you will be getting a lot of hands-on experience with a variety of computer programs. One of our principal tools will be **Microsoft Excel** (though most open-source alternatives, like Google Sheets, will be sufficient). This is the most popular spreadsheet software and is used by almost every company and researcher in the world. In other words, even if you do not plan on a research-based career, you will greatly benefit from beefing up your Excel skills. The other important program that we will be using is the free, open-source **JASP** statistics software, which will be on all of the computers in our lab room this semester (and which you should download for yourself if you own a laptop or desktop by going to <https://jasp-stats.org>). In the past, this course has used IBM's SPSS software (and many researchers, including some of our faculty, use it as well), but SPSS can be complicated and is

very expensive, while JASP is free and was created by psychologists specifically for use in psychological research. Plus, once you learn JASP, figuring out how to use SPSS is not as difficult (in case you need to use it for your senior project). The last program is an online psychology experiment program called **TELLab** (<http://lab.telllab.org/home>). I have set up a course group (Research Methods I Spring 2019) that you will sign up for online. We will be using this software to design and run experiments during several lab periods. Details will be provided in class.

#### **4. Assignments**

There will be regular assignments that will give you practice with Excel and JASP as well as enhancing your understanding of research methods and statistical concepts. These assignments will include online activities as well as printed handouts that we may complete during class or lab. All assignments are due on the dates specified on the course schedule (or in class/on Moodle if the schedule changes) and must be submitted by the beginning of class/lab to receive full credit, no exceptions.

#### **5. Lab Reports**

You will have to complete a written lab report for several of our lab-based experiment activities. Each lab report will consist of a methods section and a statistical results section, written and formatted in APA style, as they would appear in a scientific journal article. Details will be provided as we move throughout the semester.

#### **6. Exams**

There will be 4 exams in this course. I strongly advise against cramming for these tests! Exams will consist of multiple choice, short answer, and analysis questions and most will include a statistical analysis component. Each exam will focus primarily on material covered since the previous exam, but because of the nature of this course the information on the exams will really be somewhat cumulative. The 4<sup>th</sup> exam (the “final”) will be fully integrative and cumulative. On the plus side, you can drop your lowest exam score, though you are required to complete all four exams.

#### **7. Research Methods Binder**

Please purchase a 3-ring, 1” binder. Throughout the course, you will be required to keep all handouts, lab activities, class notes, assignments, and work in your class binder. This binder will serve as your own personal how-to statistical and research manual that you will reference for Research Methods 2 and your senior project. You must bring this binder with you to every lab meeting, and you are expected to manage this binder on a weekly basis to ensure that it is organized, labeled logically and well, and will actually be useful to you in the future. At the end of the semester, we will check your binders and assess to what extent the binder (a) Includes all the relevant course material, and (b) has been properly organized, labeled, and annotated to serve as a manual for you in the future. A complete binder, for example, would have the course syllabus, ethics certificates, all assignment and lab, handouts, and notes from class and lab (and the readings) about research methods and how to conduct the statistical analysis we will be using.

## Grading

Grading in this course will adhere to the Purchase policy on cheating and plagiarism. This policy explicitly prohibits cheating, plagiarism and other forms of academic dishonesty. Plagiarism is the appropriation or imitation of the language, ideas, and/or thoughts of another person and the representation of them as one's own original work. Students are responsible for familiarizing themselves with the definition of plagiarism and the acceptable methods of attribution. Plagiarism will earn you an immediate F in the course. Please refer to the college website for information on this policy: <http://www.purchase.edu/policies/plagiarism.asp>.

% Total Grade	
Participation	15 %
Assignments	20 %
Lab Reports	32 %
Exams	33 %
<b>TOTAL</b>	<b>100 %</b>

Note: There are 4 total exams in this course including the final. You will drop your lowest exam score, though you must take all 4 exams

## Academic Accommodations

Students with documented physical, learning, psychological, and other disabilities are entitled to receive reasonable accommodations. If you need classroom or testing accommodations, please contact the Office of Special Services (Student Services third floor; 251-6035) or the Counseling Center (Module 1 on Lincoln Ave., 251-6390). I encourage students with disabilities to let me know as soon as possible during the semester what, if any, special accommodations will be needed. After-the-fact accommodations will not be possible. For more information go to: <http://www.purchase.edu/studaff/specialstudentservices>

## Counseling Center

Taking care of your mental health is just as important as taking care of your physical health. The counseling center provides individual counseling (short term), group counseling, consultations and referrals, free of charge and confidentially. They are located in the Humanities building, basement level and can be reached by phone (914) 251-6390 and/or by email [cou.counseling.center@purchase.edu](mailto:cou.counseling.center@purchase.edu)). In the event that you or someone you know is experiencing an emergency (e.g., appears to be a threat to themselves or others), after hours, please contact the University Police Department (UPD) at 251-6691. If appropriate, UPD will connect you to one of our staff members, who will take steps to assist you in resolving the crisis.

## Course Schedule

All reading assignments will be posted on the course Moodle site; it is your responsibility to check regularly to check what readings are due each day. The most up-to-date schedule of topics and assignments will always be posted on the Moodle calendar (and via announcement), as this schedule will probably a bit as we move through the semester.

DATE		TOPIC		NOTES
Week 1	T	22-Jan	<b>STILL WINTER BREAK</b>	
	W	23-Jan	Class	Intro to the course & Scientific thinking
Week 2	T	29-Jan	LAB	<b>LAB 1: MEASUREMENT</b>
	W	30-Jan	Class	Distributions & Descriptive Statistics
Week 3	T	5-Feb	LAB	<b>LAB 2: OPERATIONALIZATION</b>
	W	6-Feb	Class	Probability & Hypothesis testing
Week 4	T	12-Feb	LAB	<b>LAB 3: Z-TESTS</b>
	W	13-Feb	Class	Research Ethics & Open Science
Week 5	T	19-Feb	LAB	<b>EXAM #1</b>
	W	20-Feb	Class	Review & Inferential Statistics
Week 6	T	26-Feb	LAB	<b>LAB 4: EXPERIMENT 1a</b>
	W	27-Feb	Class	Varieties of T-Tests
Week 7	T	5-Mar	LAB	<b>LAB 5: EXPERIMENT 1b</b>
	W	6-Mar	Class	Experimental Design
Week 8	T	12-Mar	LAB	<b>EXAM #2</b>
	W	13-Mar	Class	Complex Designs
Week 9	T	19-Mar	LAB	<b>LAB 6: EXPERIMENT 2a</b>
	W	20-Mar	Class	Analysis of Variance
Week 10	T	26-Mar	LAB	<b>LAB 7: EXPERIMENT 2b</b>
	W	27-Mar	Class	Observational Research and Survey Design
Week 11	T	2-Apr	<b>SPRING BREAK</b>	
	W	3-Apr		
Week 12	T	9-Apr	LAB	<b>LAB 8: OBSERVATIONAL STUDIES</b>
	W	10-Apr	Class	Additional Considerations
Week 13	T	16-Apr	LAB	<b>EXAM #3</b>
	W	17-Apr	Class	Reading Research Articles
Week 14	T	23-Apr	LAB	<b>LAB 9: ORIGINAL STUDY a</b>
	W	24-Apr	Class	Additional Considerations
Week 15	T	30-Apr	LAB	<b>LAB 10: ORIGINAL STUDY b</b>
	W	1-May	Class	The Relationship between Design and Statistics
Week 16	T	7-May	LAB	<b>LAB 11: COURSE REVIEW</b>
	W	8-May	Class	<b>EXAM #4</b> (meet in LIB1004C)

## --- School of Natural and Social Sciences Spring 2019 Events ---

### 4th Annual Darwin Day Lecture

**Tuesday, February 12<sup>th</sup> at 7:00pm**

*Red Room, Student Services Building*

*"The Next Generation of Phage Therapy in Human Health and Agriculture"*

Britt Koskella, PhD

Assistant Professor of Integrative Biology

University of California, Berkeley

**Tuesday, March 12<sup>th</sup> at 7:00pm**

*Red Room, Student Services Building*

*"Global Child Health: Principles and Competencies within the Framework of Community-Oriented Care"*

Danielle Laraque-Arena, MD, FAAP

Professor of Pediatrics and Professor of Psychiatry and Behavioral Sciences

Upstate Medical University

### 13th annual Law and Justice Lecture

**Tuesday, March 19<sup>th</sup>, 7:00pm**

*Red Room, Student Services Building*

*Gay Rights and the Constitution: Why Gay Rights Change Everything*

David Richards, PhD

Edwin D. Webb Professor of Law

New York University Law School

### 38th Annual Natural & Social Sciences Student Research Symposium

**Saturday, May 4<sup>th</sup>, 2019, 8:30am - 1:00pm**

*NS and SS Buildings*

The Natural & Social Sciences Student Research Symposium provides an opportunity for students to present their senior project research to peers, alumni, family, faculty, and members of the community.