

## Psy 210: Statistics & Design

Fall 2018

Professor Emily Fisher

Stats Lecture: Tuesday/Thursday, 1:30-2:55pm, Gulick 100

Research Lab: Tuesday/Thursday, 3:05-4:30pm, Gulick 2002

*Office Hours: Mondays 12:00-1:30, Wednesdays 1:30-3:00, and by appointment*

*Office Location: 205 Gulick Hall*

Contact: [fisher@hws.edu](mailto:fisher@hws.edu), 315-781-4548

If you have questions throughout the course, **you are encouraged** to ask during or after class, to stop in to my office hours, send me an email, and/or to make an appointment to see me.

### Course Overview

This course is all about quantitative reasoning! You'll learn the logic behind statistics and why it is such an important part of the scientific method. You'll get practice with many of the statistical techniques that psychologists use in our research, from choosing the appropriate statistic, to calculating it from data, to interpreting its meaning. You'll be better able to read and understand statistical information that you read in research articles and in everyday life. The class will also cover the basics of research design in the psychological sciences: how we measure variables, work with our human participants, collect the data that we use in our statistical analyses, and communicate those results to other scientists and to the public. Developing these quantitative reasoning skills and understanding the logic of the scientific research process are valuable skills that will pay off in other psychology classes you may take. Not only that, these skills will support you in a wide range of careers (not just in psychology!) and make you a better media consumer. When you look back on your college experience ten years from now, I truly hope that you'll find this class to be one of the most worthwhile and valuable ones you remember taking.

To accomplish these goals, we'll use a variety of pedagogical techniques to support your learning. The class involves a combination of lectures, discussions, demonstrations, and individual and small-group activities. The secret to success in a class like this is regular, repeated practice. So, in addition to the time you spend in class, you should plan to spend significantly more time out of class on studying, reading, writing, completing homework and assignments, doing practice problems, and coming to office hours with questions. A major portion of the class involves a group laboratory project, in which you will run a research study. This project, in particular, will require out of class work to schedule and meet with participants. You should expect this class to take a lot of your time this semester.

That said, if you are willing to put in the effort, it will pay off. You can achieve this, and I'm here to support you!

### **Course Goals and Objectives:**

1. Students will learn how to calculate and interpret descriptive and inferential statistics, both by hand and using software packages for statistical analysis. These include, but are not limited to, measures of central tendency, measures of variance, hypothesis tests, correlations, regressions, non-parametric tests, etc.
2. Students will learn the about probability and the basic theoretical foundations of various statistical tests (such as those mentioned above).
3. Students will learn how to choose the appropriate design and analysis to use for different types of research questions and methodologies.
4. Students will read and learn to comprehend various statistical tests as presented in primary research literature.
5. Students will learn the basics of psychological research methods, and apply these concepts in a major research project.
6. Students will learn how to write and communicate about psychological research, and be able to use APA style and formatting.

## **Course Rules and Expectations**

### **Necessary Materials**

1. Textbook: Heiman, G. W. (2012). STAT (2nd edition). Wadsworth Cengage. ISBN: 978-1-28545-144. Bring your textbook to class with you every day.
2. Calculator: Although not required, having a calculator on hand will let you work through the arithmetic portion of statistics problems more quickly. During most classes, you may use the calculator app on your smartphone. However, during exams, you will not be able to use a phone and should plan to bring a dedicated calculator with you.
3. Notebook, pens and pencils: You must have paper and writing utensils with you in class every day.
4. Data storage: You will need a way to save files that we work on during lab, and saving your work to the lab computer's desktop or hard drive is not reliable. Everyone has networked storage space available through the HWS servers. If you don't already know how to use it, this is a good time to learn – see the handout on Canvas or drop by the Help Desk for an explanation. Alternatively, you could bring a flash drive or set up an account with a cloud-based service like Dropbox.

### **Attendance**

Attendance is fundamental to academic success. Being present and engaged in class is a basic expectation. If you must miss a class, you should make arrangements with a classmate to meet and review notes from that day together. After you have done so, you should come to office hours to ask me any other questions you have about the material covered that day. However, there is no way to truly make up a missed class, as the discussions, demonstrations and activities that occur don't have the same effect when someone else is telling you about them later.

### **Participation and Engagement**

To succeed in the class, you need to do more than just show up. I expect you to be prepared for class every day – that means you've done the reading and homework, and reviewed your notes from the prior

class before we begin. You should be prepared to answer questions, whether you're raising your hand or not. You should be ready to share your comments and ideas during full-class and small-group discussions, and to respond to your classmates' comments and ideas. In short, you need to be paying attention!

If you are doing anything that distracts others or interferes with your classmates' learning, you will be asked to leave class. This includes, but is not limited to: making disrespectful or offensive comments, using electronics inappropriately, talking about things unrelated to class during class time, and sleeping.

You may eat in Gulick 100 if you need to, but please choose foods that you can eat quietly and neatly without distracting others, and clean up after yourself. Food and beverages are not allowed in the Gulick 2002 computer lab.

### **Late Work Policies**

This class moves quickly to cover a lot of material in a short time, so deadlines are set to help you keep up and manage your time. You should strive to meet all deadlines; that said, there are circumstances that might warrant an exception. Generally, these include things like medical problems, family emergencies, religious observances, or travel for college-sponsored events.

If you must miss an in-class exam, you will need to provide written documentation to support your excuse in order to be eligible for a makeup exam. You should talk to me as far in advance of the exam as you can, and plan to schedule the makeup as close to the exam date as possible.

For take-home exam sections, papers and lab assignments, unless you have arranged for an extension on the deadline in advance, your work will receive a 10% penalty for each day (i.e., for each 24-hour period following the deadline) that it is late. The points will be subtracted from your score on the assignment. Remember that you may turn work in early if you can't be present in class at the time that it's due!

Because we will discuss solutions to homework problems and SPSS assignments soon after they are due, you cannot get credit for late homework and SPSS assignments. If you read the grading criteria below, you'll see that you can miss a small percentage of these assignments with a negligible effect on your grade, so there is some room for flexibility in case of an emergency. Again, you may turn these in early if you can't be present in class when they are due.

### **Extra Credit**

At my discretion, there may be opportunities for extra credit throughout the semester. Any extra credit opportunity will be offered to all students – under no circumstances will any student be allowed to complete an individual extra credit project. Extra credit opportunities will be announced in class.

Easter egg for those of you who are reading the syllabus as assigned: here's your first extra credit opportunity! Email Prof. Fisher with a funny and/or cute picture of an animal by Aug. 31 and you'll start off the semester with 3 free points. 😊

## Assessment & Grading Criteria

Final grades for the course will be based on:

<b>TOTAL</b>	<b>975 points</b>	<b>Approximate weight:</b>
<b>Exam 1</b>	75 points	8%
<b>Exam 2</b>	100 points	10%
<b>Exam 3</b>	100 points	10%
<b>Final Exam</b>	150 points	15%
<b>Homework</b>	100 points	10%
<b>SPSS Assignments</b>	100 points	10%
<b>Group Research Paper &amp; Presentation</b>	175 points	18%
<b>Individual Research Proposal</b>	100 points	10%
<b>Research Project Lab Assignments</b>	75 points	8%

<b>Grade</b>	<b>Percentage</b>	<b>Points</b>
<b>A+</b>	Above 97%	>945.75
<b>A</b>	92-96.99	897.0-945.5
<b>A-</b>	90-91.99	877.5-896.75
<b>B+</b>	88-89.99	858.0-877.25
<b>B</b>	82-87.99	857.75-799.5
<b>B-</b>	80-81.99	780.0-857.25
<b>C+</b>	78-79.99	760.5-779.75
<b>C</b>	72-77.99	702.0-760.25
<b>C-</b>	70-71.99	682.5-701.75
<b>D+</b>	68-69.99	663.0-682.25
<b>D</b>	62-67.99	604.5-662.75
<b>D-</b>	60-61.99	585.0-604.25
<b>F</b>	Below 60%	< 585

**Exams:** There will be four exams during the semester: three mid-term exams and a final exam. Because of the nature of statistics, each exam will build on the previous exam, *making each test cumulative*. For example, in order to do well on Exam 2, you will need to have mastered the skills from Exam 1. Each exam will have an in-class section as well as a take-home section. You will receive the take-home section after you complete the in-class section and will have a few days to complete it. On the take-home section, you can use your book and notes, but you must work on it alone (no collaborations with classmates or assistance from others). Exams will cover material from both the lecture section and the lab section of the course.

**Homework:** You can expect to have a homework assignment for each chapter in the textbook, and depending on the course schedule this could mean more than one per week at times. These will consist of a selection of practice problems from the end of the chapter. The purpose of these assignments is to give you practice with the skills we're learning, and to let me see how well the class is mastering or struggling with these skills. I will post solutions to the homework problems on Canvas after you turn

them in, and you are responsible for comparing your work with the solutions to learn from your mistakes. Because the solutions will be posted soon after each due date, no late homework will be accepted.

These will be graded on a plus/check/minus basis: you'll get a plus for turning in mostly-accurate work that shows you're learning the material, a check for assignments that show a good-faith effort but reveal some misunderstandings of the material, and a minus for missing assignments or assignments that show minimal effort. At the end of the semester, your homework performance will be converted to points according to the following criteria:

Plusses on 100% of assignments	100 points
Plusses on > 85% of assignments	95 points
Plusses on > 75% of assignments (minuses on < 10%)	85 points
Checks or plusses on > 85% of assignments	80 points
Checks or plusses on > 75% of assignments	75 points
Checks or plusses on > 65% of assignments	65 points

**SPSS Assignments:** One component of lab will be learning to use software as a tool to help us understand statistics. You will get a short assignment corresponding with each unit of the class that will ask you to use SPSS to answer statistical questions. Just like homework, these will be graded on a plus/check/minus system and converted to points at the end of the semester according to the same criteria.

**Group Research Project, Research Proposal, and Lab Assignments:** During the semester, you will create, develop, and carry out a group research project to replicate a recently-published psychology study. The project will require you to develop a research plan, collect and analyze data, and share your results with the class in a presentation. You will also work individually to design a hypothetical study that answers a question your group project can't, and will write about this proposed study in an individual paper. We'll work through the components of this project in lab as the semester progresses. For now, anticipate that it will involve a group paper, an individual paper, graded drafts and other lab assignments along the way to help you develop your project, and an informal presentation at the end of the semester.

## Information from the Colleges

**Academic Integrity:** You are expected to be familiar with the colleges' standards for academic integrity and the definition of plagiarism. To review these, please see the Handbook on Community Standards ([http://www.hws.edu/studentlife/community\\_standards.aspx](http://www.hws.edu/studentlife/community_standards.aspx)). From this, it is obvious that you should not turn in an assignment or exam that is not wholly your own work. If in doubt, please talk to me for clarification. Academic dishonesty of any kind is a serious offense and will be treated as such. *Any instance of academic dishonesty will result in a failing grade on that exam or assignment, may result in a failing grade for this course, and will be reported to the Dean's Office and Committee on Standards.*

**About the Center for Teaching and Learning (CTL):** At Hobart and William Smith Colleges, we encourage you to learn collaboratively and to seek the resources that will enable you to succeed. The **Center for Teaching and Learning (CTL)** is one of those resources: CTL programs and staff

help you engage with your learning, accomplish the tasks before you, enhance your thinking and skills, and empower you to do your best. Resources at CTL are many: Teaching Fellows provide content support in 12 departments, Study Mentors help you manage your time and responsibilities, Writing Fellows help you think well on paper, Q Fellows support you in courses that require math, and professional staff help you assess academic needs.

I encourage you to explore these and other CTL resources designed to encourage your very best work. You can talk with me about these resources, visit the CTL office on the 2<sup>nd</sup> floor of the library to discuss options with the staff, or visit the CTL website.

For our class, CTL also offers a group **Study Table** for help with course content. *This Study Table is facilitated by an accomplished student who has already taken this class; he/she will help you engage with the complexities of learning statistics*, and the group-study opportunity will enhance your study time. More information about the Study Table will be available in the first two weeks of classes.

**Disability Accommodations:** If you are a student with a disability for which you may need academic accommodations in this course, you should self-identify, provide appropriate documentation of your disability, and register for services with Disability Services at the Center for Teaching and Learning (CTL). Disability related accommodations and services generally will not be provided until the registration and documentation process is complete. The guidelines for documenting disabilities can be found at the following website: [http://www.hws.edu/academics/ctl/disability\\_services.aspx](http://www.hws.edu/academics/ctl/disability_services.aspx)

Please direct questions about this process or Disability Services at HWS to Christen Davis, Coordinator of Disability Services, at [CTL@hws.edu](mailto:CTL@hws.edu) or x3351.

## Lecture Schedule

Schedules are subject to change. If that occurs, see Canvas for an updated schedule.

week	Date	Topic	Read before class
1	Aug 28	Course overview & introductions	
	Aug 30	Why statistics matters!	STAT Ch. 1, Math Review section
2	Sept 4	Frequency Distributions	STAT Ch. 2
	Sept 6	Central Tendency	STAT Ch. 3
3	Sept 11	Central Tendency	STAT Ch. 3
	Sept 13	Variability	STAT Ch. 4
4	Sept 18	Variability	STAT Ch. 4
	Sept 20	Reliability & Validity	
5	Sept 25	<b>Exam 1</b>	
	Sept 27	Z-scores and normal distributions	STAT Ch. 5
6	Oct 2	Z-scores and normal distributions	STAT Ch. 5
	Oct 4	Probability	STAT Ch. 6
7	Oct 9	Fall Break – No classes	
	Oct 11	Probability	STAT Ch. 6
8	Oct 16	Hypothesis testing	STAT Ch. 7
	Oct 18	Hypothesis testing	STAT Ch. 7
9	Oct 23	<b>Exam 2</b>	
	Oct 25	One Sample t-test	STAT Ch. 8
10	Oct 30	One Sample t-test	STAT Ch. 8
	Nov 1	Two Sample t-test	STAT Ch. 9
11	Nov 6	Two Sample t-test	STAT Ch. 9
	Nov 8	Correlation & Regression	STAT Ch. 10
12	Nov 13	Correlation & Regression	STAT Ch. 10
	Nov 15	<b>Exam 3</b>	
13	Nov 20	Thanksgiving – No classes	
	Nov 21		
14	Nov 27	One-way ANOVA	STAT Ch. 11
	Nov 29	One-way ANOVA	STAT Ch. 11
15	Dec 4	Two-Way ANOVA	STAT Ch. 12
	Dec 6	Non-Parametric Stats	STAT Ch. 13
16	Dec 11	Non-Parametric Stats	STAT Ch. 13
		<b>Lecture Final: Sat, Dec 15, 7:00pm</b>	<b>Final Exam</b>
		Lab Final: Tues, Dec 18, 8:30am	

## Lab Schedule

week	Date	Topic	Readings & Assignments Due
1	Aug 28	No lab	
	Aug 30	Intro to Research Projects; Scientific Method	
2	Sept 4	Ethics and IRB; Create Research Groups	
	Sept 6	Intro to SPSS	
3	Sept 11	Creating Data Files in SPSS	IRB Training Certificate due; Lab Group Assignment #1 due
	Sept 13	Frequency Distributions in SPSS, Types of Data Measurement	
4	Sept 18	Surveys and Observations, Central Tendency in SPSS	
	Sept 20	Sampling, Variability in SPSS	Lab Group Assignment #2 due
5	Sept 25	Literature Search Strategies; Reliability & Validity in SPSS	
	Sept 27	Correlational Designs	Citation Assignment due
6	Oct 2	APA Writing: Format and Style; Z-scores in SPSS	
	Oct 4	Experimental Designs	APA Style Assignment due
7	Oct 9	Fall Break – No classes	
	Oct 11	APA Writing: Method Sections; Developing Hypotheses	
8	Oct 16	APA Writing: Introduction Sections;	
	Oct 18	Writing Workshop	Group Methods Drafts Due
9	Oct 23	Group & Individual Meetings	
	Oct 25	Group & Individual Meetings	
10	Oct 30	One-sample t-test in SPSS	Research Proposal Drafts Due
	Nov 1	Writing workshop	Group Lab Assignment #3 due
11	Nov 6	Two-sample t-test in SPSS	
	Nov 8	SPSS Workshop	
12	Nov 13	Correlation and Regression in SPSS	
	Nov 15	APA Writing: Results and Discussion sections	
13	Nov 20	Thanksgiving – No classes	
	Nov 21	Thanksgiving – No classes	
14	Nov 27	APA Writing: Tables and Figures	
	Nov 29	One-way ANOVA in SPSS	Final Research Proposals Due
15	Dec 4	Two-way ANOVA in SPSS	
	Dec 6	Preparing Research Presentations	Group Results/Discussion Drafts due
	Dec 11	Non-parametric Stats in SPSS	
16		Lecture Final: Sat, Dec 15, 7:00pm	
		<b>Lab Final: Tues, Dec 18, 8:30am</b>	<b>Group Presentations; Final Group Papers Due</b>