

Statistical Methods in Psychology  
PSYC 200  
Spring 2015

**Psychology 200**  
**Statistical Methods in Psychology**  
**Spring 2015**

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**Course Philosophy**

Some of you will produce or use statistics in your life's work and many of you will not. We all, however, are consumers and victims of statistics. We make choices under uncertainty on a daily basis, and statistics are often available to help us if we know how to interpret them. Moreover, other people will use statistics to make choices for us. For example, statistics often inform public policy decisions, medical advice and procedures, and recommendations for safety features on cars – the list is endless. And of course, statistics is at the core of psychological and behavioral research. In order to avoid common errors in human judgment and decision-making, to understand the basis for many public policy and other decisions that affect you, and to understand an important component of psychological research, you must have a basic foundation in statistical thinking and practice.

**Course learning objectives.** The objectives of this course are to provide you with:

1. A basic foundation in statistical thinking and practice.
2. The necessary background for more advanced courses in statistics, experimental design, or research methods.
3. Improved critical reasoning skills

Upon successfully completing this course, you will have a good understanding of descriptive statistics, as well as a basic, theoretically grounded understanding of probability theory and the principles of research design and inferential statistics. You will be able to summarize data, do simple statistical tests, better understand statistical aspects of news reports, and be prepared for more advanced courses if you want to take them. In addition, you will understand some of the errors that people usually make in reasoning about uncertainty and be in a position to avoid them.

**Prior knowledge and course level.** We will assume that you have an introductory-level background in psychology, knowledge of high-school algebra, and no prior training in logic. We will focus on concepts and theory rather than on tedious calculations. You still will have to do calculations in order to implement and understand the concepts. We expect you to gain a good understanding of statistics and statistical thinking, not simply learn how to plug numbers into formulas.

### How to Study

**This is not a cookbook course.** Simple memorization and merely learning how to plug numbers into formulas will not get you very far in this course. Lectures, discussion, homework, and exams all will involve a mix of formulas, numerical calculations, and conceptual thinking. *Treat this course as a combination of mathematics, psychology, and logic.* You must keep up with the material on a day-to-day basis and you must do the assigned homework. You will benefit from doing additional problems at the ends of the chapters.

**The only way to get a handle on this material is to work with it, which means actively studying on a regular basis.** The most effective way to learn is to divide your study and homework time over multiple days per week. For a few of you, two to four hours outside of class distributed over the week may be enough, others of you will require five to seven hours of study per week, and yet others may require somewhat more time. Skim or read the assigned material before lecture to get the gist of what we will cover. Read it again after lecture, this time more carefully and work with it actively, not passively. Do problems, complete assigned activities, and test yourself as you go along. Small study groups are a good idea for some people. It is fine to study together, but test yourself privately to be sure you understand the material. Regularly go back to material covered earlier and work a few problems. We will assign homework to be handed in at the beginning of some classes.

**Ask questions.** You will learn much better if you think actively about the material. If you don't understand something, ask right away in class. Almost certainly, someone else will have the same question.

**The material is cumulative. Do not let yourself get behind, as each topic builds on the previous one.**

### **Course Mechanics and Rules**

**Lecture Time.** Lecture sections will serve as both lecture and discussion. This time is interactive and your participation is expected. Preparing for class is necessary for your participation and for the lecture to proceed smoothly. ***There should be no laptops in lecture.*** You need to attend the lecture section in which you are enrolled for your participation points.

**Lab time.** There is an in-class portion and an online portion to lab. You will be required to go to your lab discussion section every other week. On week that you are not in lab discussions, you will be required to complete online assignments that may include watching videos and additional statistical problem sets.

**Computers and calculators:** You may use calculators when doing your homework and on the exams. You must also show your work by writing the equations and showing how you inserted the data. Some of the assigned homework problems will require you to use a computer. We will use Microsoft Excel in labs and for some homework. A calculator will also help you follow along with example problems in lecture and lab so we encourage you to bring calculators to lecture and lab.

**Professional Conduct:** Professional conduct is expected in this course, as we want you to learn and practice this conduct for your future careers. Additionally, in being professional you will be showing respect to the teachers as well as to your fellow students. You are expected to be respectful and courteous with your instructor and TA's both in and out of class. This entails: 1) Arriving to class on time, 2) Turning off your cell phone before class begins, 3) Not using class time to check social networking websites, comics, instant messaging services, or other off-task, on-line behavior, 4) Not using class time to read or send text messages on your phone, and 5) Professional conduct when writing emails. Think of this last point as an opportunity to practice the kind of writing you will use when inquiring about job opportunities, communicating with your supervisor, and so forth.

**Homework Etiquette:** Professional conduct is necessary during the assessment portions of this class as well. Show your work. You may use Excel to check your answers, but you may not let Excel do all the work for you. ***You are expected to work alone on homework.*** You are

also expected to maintain your homework at all times and ensure that no other students view your homework as that is considered collaboration. If you have questions or concerns, speak to your professor and/or one of the TA's, come to one of the many office hours that are available, or make use of the tutoring options that are available and listed below in the "Tutoring Options" section.

**Exam Etiquette:** During exams, students will spread out throughout the room as much as possible. For all exams, students may use the course textbook, their personal notes from class, and a calculator. No talking or collaboration is allowed on exams. If you show up late to an exam, you will nonetheless be expected to stop at the appointed end time.

## Grades

### CALCULATION OF FINAL GRADES

The final grade will be based on a total of 200 points as follows (not including extra credit):

|                                   |                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------|
| Homework (12 scores)              | 40 points (calculated by multiplying 40 by your average percentage on homeworks)     |
| Participation                     | 10 points (calculated by multiplying 10 by your average percentage on participation) |
| Exams 1-2                         | 70 points (35 points each)                                                           |
| Final exam (partially cumulative) | 40 points                                                                            |
| Writing project                   | 40 points                                                                            |

Total scores for the course will be calculated by summing each student's scores on the above requirements. Extra credit points will be added into this total; thus, technically, it will be possible to earn 201 points. Without exception, course grades will be assigned according to the following points (using typical rules for rounding decimal points):

|              |               |              |
|--------------|---------------|--------------|
| A+ = 194-200 | A = 186-193   | A- = 180-185 |
| B+ = 174-179 | B = 166-173   | B- = 160-165 |
| C+ = 154-159 | C = 146-153   | C- = 140-145 |
| D = 120-139  | F = below 120 |              |

**Homework.** Homework will consist of multiple homework sections online through Aplia. All Aplia assignments will be due at 8:00am on the day indicated on the syllabus (usually a Tuesday). There may be one or more Aplia modules assigned each week. Your homework grade will be computed to be a total percentage correct by summing all your correct points relative to the total points across all modules.

***We do not accept late homework.*** You must turn in all homework either early or on time to receive any credit. This is similar to you being on time for work – you often get penalized (explicitly or implicitly) for showing up late to work. If you have a valid, University

sanctioned excuse (see later in the syllabus for more detail on this) to turn in a homework assignment late, you may bring the documentation to us and we will evaluate this exception.

*General timeline of homework:* 1) Homework will be posted on Tuesday; 2) Homework will be due on the following Tuesday; 3) Homework will be graded and the grades posted on Canvas within a week. It will generally take 1 week for homework assignments to be graded. This schedule is not precisely followed during exam weeks and you will be notified of that during lecture as well.

**Exams.** There will be two in-class exams and a final exam. There will be a review session prior to each exam for you to bring your questions and discuss any remaining problems. For all exams, students may use the course textbook, their personal notes from class, and a calculator. The exams will be a combination of solving and interpreting statistics questions. It will generally take two weeks for exams to be graded.

**Writing Project: Critiquing Statistics.** One short writing project is due at the start of lab on May 5. This project—an analysis and critique of a newspaper or magazine article—will give you a chance to develop your critical thinking and writing skills in relation to real life statistics. Additional information on the project will be posted on Canvas.

**Participation.** Participation is based on three things: 1) Lecture participation; 2) Online lab participation/completion; and 3) In-person lab participation.

1. Lecture participation: There will be daily in-class activities/assignments throughout the semester. These activities will occur neither consistently at the beginning nor consistently at the end of the class and may be at multiple times in the lecture. Participation, not accuracy, is graded. These activities will take place in lecture and are paper based. If you miss an activity for an excused absence you will still be awarded the participation points when you provide valid documentation. This documentation should be presented prior to missing the class or no later than the next class if an emergency. You will receive “freebies” for up to two unexcused lecture participation experiences if you do all other class participations activities (listed below).
2. Online lab participation (every other week, alternating with in-person labs):
  - a. Some online labs will involve watching a video and completing online quizzes. To get full participation credit, you must watch at least 50% of the video and complete the online quizzes presented in the video to help you master the material. We are not grading your quizzes for accuracy; rather we are grading to see if you watched at least 50% of each video segment and if you attempted to answer the quiz questions (regardless of whether your answers are correct). We will randomly select *one* video from each week to grade for participation if there is more than one video.
  - b. Other online labs will involve completing additional practice problems. Completing these problems will count towards your participation grade. Again, we will be grading for completeness and reasonableness rather than strict accuracy.

3. In-person lab participation (every other week, alternating with online labs): On weeks when you attend lab in person, you will be given problems to work on to help you master recent course material and prepare for exams. These labs will give you opportunities for more individualized assistance and for learning from your peers' questions. As with online labs, work will be graded for completeness and reasonableness rather than accuracy.

**Extra Credit.** There is one extra credit opportunity in this class. You may earn 1 extra credit point for completing an online learning assessment that is being developed by our department. The assessment will be offered at the end of the semester. To earn credit, the assessments must be completed in the time frame specified and with good intent (i.e., taken seriously). Instructions will be sent by email later in the semester.

**Grading.** The class has TAs who do all of the homework, exam, participation and paper grading. If you have a question about a grade, talk to your TA first. Grades for homework and exams will be posted on Canvas shortly after the assignments are graded. We anticipate a weekly turnaround on grading, although it may at times be shorter or longer. If you have a grading question about any specific assignment, talk to the TA *immediately*. You will have **two weeks** after receiving a grade to dispute it. At that point, it will be assumed that you agree with the grade you received. This grading policy also applies to the grades that you receive for in-class activities. Please note that having questions you may have about how an assignment was graded and disputing a grade are separate concepts and processes. Thus, your TA can address questions you may have about the grading of an assignment, but grades disputes should be handled as outlined in the Re-Grading section below. Your course grade will be converted to a letter grade as dictated by the University. The grading rules are precise and generous and therefore they will be followed without exception and with **no rounding** beyond one decimal place. For example, if your final grade is calculated to be 89.8945, your final grade for the course will be 89.9 and you will receive a B+ for the course.

**Grade Disputes and Re-Grading:** Occasionally, students are unhappy with a grade they have received. If you feel that you want your homework, exam, or final paper re-graded, you must present, in writing, your request for a re-grade within *two weeks* of the day the assignment is returned to class. Your written request must include a valid reason to merit your request for a re-grade. Your reasons for why you should get points back must be substantiated by the class textbook, class readings or class notes. It must also be evident in your written request for a re-grade that you have thoroughly read the answer key and have evaluated your assignment in light of the answer key. If your documentation and argument are sufficient, the assignment will then be re-graded by a different grader. By requesting a re-grade, you agree that the new grade will be the permanent grade. Please note that your re-grade may be *higher OR lower* than your original grade. Assignments will be re-graded only once.

**Office hours:** Our office hours are listed above. We encourage you to make appointments during those hours or for other times that better fit your schedule.

**Class Web Page.** We will use the Canvas Academic Suite available at <https://elms.umd.edu> for this course. Log in there and follow the links to PSYC 200. We will make this syllabus and syllabus updates available there. In addition, we intend to post the overheads used in lecture so that you can download them.

**Tutoring Options.** For those of you who would like additional help mastering this material, the Academic Achievement Programs (AAP) offers free tutoring for PSYC200 students through the Academic Success and Tutorial Services (ASTS). You may contact Christine Duchouquette ([cduchou@umd.edu](mailto:cduchou@umd.edu)) for more information.

Additionally, the math department has tutoring for STAT 100 and students may go there for free tutoring. OMSE also provides tutoring and they have someone who generally does stats tutoring Tuesdays, Wednesdays, Thursdays, and Fridays between 10:30 – 3:00. And, you are of course always encouraged to come to the instructor or your TA with any questions or difficulties that you are experiencing.

**Evaluations:** Your feedback about this course is very important to us and therefore we do several forms of evaluations throughout the semester. One important campus-wide evaluation is the online evaluation at the end of the semester. Students can go directly to the website ([www.courseevalum.umd.edu](http://www.courseevalum.umd.edu)) to complete their evaluations prior to the start of exam week.

### **Textbooks and Readings and Required Material for the Course**

**Required.** Pagano, R. R.. Understanding Statistics in the Behavioral Sciences, Edition 10. Belmont CA: Wadsworth/Thomson Learning.

**Required.** Aplia software access code (see Canvas for course key for Aplia)

**Readings.** Additional readings may be assigned to supplement the Pagano text and will be available on Canvas.

### **Attendance policies**

**All Absences:** It is the policy of the University to excuse student absences resulting from (a) illness of the student (or a dependent as defined by Board of Regents policy on family and medical leave); (b) religious observance (where the nature of the observance prevents the student from being present during the class period); (c) participation in university activities at the request of University authorities; and (d) compelling circumstance beyond the student's control. Students claiming excused absence must apply in writing and furnish documentary evidence that the absence resulted from one of these causes. Students are responsible for learning about any material or announcements missed and for initiating a process to make up missed work. Unless otherwise approved by the instructor, any work due on the missed day(s) must be submitted by the first class meeting after the absence.

**Absences due to illness or injury:** University of Maryland policy dictates that a single absence during the semester due to illness or injury will be excused with a signed and dated

letter attesting to the date of the health problem and acknowledging that the information is true and correct and that providing false information is prohibited under the Code of Student Conduct. The letter must be submitted by the first class meeting after the absence, and only one such letter is allowed in the class during the semester. This policy does not apply when the absence occurs on a major graded event (i.e., exam, paper due date) or is for more than a single class. Multiple absences, and those occurring on a major scheduled grading event, require written documentation of the illness or injury from the Health Center or an outside health care provider. The signed and dated letter must verify the dates of treatment and the time period during which you were unable to meet academic responsibilities. The letter must be provided on the first class meeting after the multiple absences. Accommodations for such absences will be arranged on a case-by-case basis.

**Scheduled Absences:** When the absence is due to a major scheduled event (e.g., religious observances, jury duty), the student must provide written notice of the absence by the second week of the semester (or as soon as possible thereafter if the student learns about the scheduled absence after the second week) in order to have the absence excused. If an exam is given during this planned absence, this written notice must include a request for a make-up exam.

**Participation points:** If you miss a class for an excused and documented reason you will receive participation points for that day if you provide your documentation prior to missing the class or by the next class you attend.

**Final paper points:** If you fail to turn in your final paper on time due to an excused and documented reason you will be provided 24-72 hours to turn in your paper. Your time extension will be considered on a case to case basis depending on the nature of the excuse assuming that you also provide your documentation when turning in your final paper.

**Missing Exams:** If some extreme event or religious observance is going to require you to miss an exam, you must talk with us about missing the exam at least one week before the exam date. Claims of physical illness or distress must be accompanied by documentation from a physician or mental health practitioner. Claims of death in the family must be accompanied by a funeral announcement (or analogous documentation).

The make-up assessment will be at a time and place mutually agreeable to the instructor and student, will cover only the material for which the student was originally responsible, will be at a comparable level of difficulty with the original assessment, and will be given within a time limit that retains the currency of the material.

**Special Accommodations:** Appropriate special arrangements will be made for students with documented disabilities. Students with documented disabilities should report them to the instructor immediately so that proper arrangements can be made.

**University Closure:** If the University is closed due to inclement weather, emergency, etc. during a scheduled class period, that class period will be shifted to the next time we will meet. Therefore, any exams or papers that are due will be due the following class. This does

not mean the deadlines for following projects or exams will be changed, however, so plan your time accordingly. Make sure to check the University's website for information on closures.

### **Academic Integrity and Accommodations**

**Academic Integrity:** The University is one of a small number of universities with a student-administered Code of Academic Integrity and an Honor Pledge. The Code prohibits students from cheating on exams and assignments. Cheating includes, but is not limited to, plagiarizing, copying another student's answers, bringing cheat notes in for the exam, etc. You will be asked to write the following signed statement on each examination or assignment:

*I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination.*

**Academic Dishonesty:** All students are expected to abide by the University's Code of Academic Integrity which is printed in the Undergraduate Catalog (also see <http://www.studenthonorcouncil.umd.edu/code.html>). Academic dishonesty (cheating, fabrication, facilitating academic dishonesty, and plagiarism) will not be tolerated. The definitions for these offenses are printed in the Code of Academic Integrity, and we urge you to familiarize yourselves with them. Academic dishonesty is a serious offense and will be dealt with according to University policy.

The *Code of Academic Integrity* is reprinted in full in the Undergraduate catalog for further information, to report Academic Dishonesty, or to inquire about serving on the Honor Council call 301-314-8204.

<http://www.testudo.umd.edu/soc/dishonesty.html>

Note that ignorance of the student conduct policy is not an accepted excuse for committing academic dishonesty. Issues relating to academic dishonesty will be sent to the Office of Student Conduct.

*Please read the Ethics of Scholarship in Psychology handout that is also available on Canvas.*

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| Date            | Topic                                | Reading & Assignment                              | Lab                                                     |
|-----------------|--------------------------------------|---------------------------------------------------|---------------------------------------------------------|
| <b>Tu 01/27</b> | Introduction & Review                | Section 1.1-1.2                                   |                                                         |
| Th 01/29        | Experiments & Measurement            | Section 1.3-1.9, Chapter 2                        |                                                         |
| <b>Tu 02/03</b> | Measurement Cont., & Describing data | Chapters 2 & 3<br><b>HW1, Contract</b>            | 0100 Sections online<br>0200 Sections in-lab            |
| Th 02/05        | Describing data, Central Tendency    | Chapter 3 & Sections 4.1-4.2<br>G&S 7-18          |                                                         |
| <b>Tu 02/10</b> | Variability, Z-Scores                | Sections 4.3-4.4 & 5.3<br>G&S 19-26<br><b>HW2</b> | 0100 Sections in-lab<br>0200 Sections online            |
| Th 02/12        | Lying with Statistics & Correlation  | Chapter 6                                         |                                                         |
| <b>Tu 02/17</b> | Correlation                          | Chapter 6<br><b>HW3</b>                           | 0100 Sections online<br>0200 Sections in-lab            |
| Th 02/19        | Correlation & Regression             | Chapter 7                                         |                                                         |
| <b>Tu 02/24</b> | Review                               | <b>HW4</b>                                        | 0100 Sections in-lab<br>0200 Sections online            |
| Th 02/26        | Exam 1                               |                                                   |                                                         |
| <b>Tu 03/03</b> | Sampling & Probability Intro         | Chapter 8<br><b>APA Formatting Quiz</b>           | <i>Optional in-lab exam key review for all sections</i> |
| Th 03/05        | Probability                          | Chapter 8, Gonick & Smith                         |                                                         |
| <b>Tu 03/10</b> | Probability                          | Chapter 8, Gonick & Smith<br><b>HW5</b>           | 0100 Sections online<br>0200 Sections in-lab            |
| Th 03/12        | Normal Distribution                  | Section 5.1 – 5.2                                 |                                                         |
| <b>Tu 03/17</b> | SPRING BREAK                         |                                                   | SPRING BREAK                                            |
| Th 03/19        | SPRING BREAK                         |                                                   |                                                         |
| <b>Tu 03/24</b> | Binomial Distribution                | Chapter 9<br><b>HW6</b>                           | 0100 Sections in-lab<br>0200 Sections online            |
| Th 03/26        | Binomial Distribution                | Chapter 9                                         |                                                         |
| <b>Tu 03/31</b> | NHST                                 | Chapter 10<br><b>HW7</b>                          | 0100 Sections online<br>0200 Sections in-lab            |
| Th 04/02        | NHST                                 | Chapter 10                                        |                                                         |
| <b>Tu 04/07</b> | Review                               | <b>HW8</b>                                        | 0100 Sections in-lab<br>0200 Sections online            |
| Th 04/09        | Exam 2                               |                                                   |                                                         |
| <b>Tu 04/14</b> | Power & Effect Size                  | Chapter 11                                        | <i>Optional in-lab exam key review for all sections</i> |
| Th 04/16        | Sampling distribution of the mean    | Chapter 12                                        |                                                         |
| <b>Tu 04/21</b> | z-tests (one group)                  | Chapter 12<br><b>HW9</b>                          | 0100 Sections online<br>0200 Sections in-lab            |
| Th 04/23        | t-tests (one group)                  | Chapter 13                                        |                                                         |
| <b>Tu 04/28</b> | t-tests (two groups)                 | Chapter 14<br><b>HW10</b>                         | 0100 Sections in-lab<br>0200 Sections online            |
| Th 04/30        | t-test (two groups)                  | Chapter 14                                        |                                                         |
| <b>Tu 05/05</b> | One-way ANOVA                        | Chapter 15<br><b>HW11, Writing Project</b>        | 0100 Sections online<br>0200 Sections in-lab            |
| Th 05/07        | One-way ANOVA                        | Chapter 15                                        |                                                         |
| <b>Tu 05/12</b> | Review                               | <b>HW12</b>                                       | 0100 Sections in-lab<br>0200 Sections online            |

\*This is a guideline for the course, and is thus subject to change.