

STATISTICAL APPROACHES FOR DEVELOPMENT AND FAMILY RESEARCHERS

Lecture: Room G025 Fowler Memorial House (FWLR)
Tuesday & Thursday, 9:00 – 10:15 a.m.

Lab: Room B286 Beering Hall (BRNG)
Friday, 9:30 – 10:20 a.m.

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Hillenbrand C100
or by appointment

Course Description and Objectives:

This course is designed to provide you with a basic understanding of foundational concepts and tools used in statistical analysis in the behavioral sciences, with a focus on analysis of experimental data. While theoretical and mathematical basics of statistical methods will be covered, **emphasis is placed on the application of the methods, including a conceptual and interpretive understanding of the methods.**

The first half of the course covers a broad range of topics most of which is review for the typical incoming graduate student. These topics include, for example, probability, central tendency, variability, the normal distribution, sampling and sampling distributions, estimation, hypothesis testing, association, regression & correlation, experimental designs, and reliability & validity. The second half of the course is focused on ANOVA modeling and introduction to multiple regression.

The primary goal is for students to develop an ability to apply these statistical methods using a statistical software package to their substantive research questions and to understand and communicate their meaning.

Learning objectives:

- Develop a basic understanding of probability, sampling, and inferential theory underlying statistical methods
- Formulate testable hypotheses
- Apply proper statistical tests to evaluate hypotheses
- Properly interpret the statistical estimates and tests that we cover in the course
- Run data analysis using Stata statistical software

Learning objectives continued:

- Improve analytic and critical thinking skills
- Improve written and verbal communication of analytic results
- Understand ANOVA modeling methods
- Use statistical methods to test research questions using real data and statistical software

Communication:

Communications to the class will be administered using the “Announcements” feature on BlackboardLearn, which both 1) emails each announcement to students’ @purdue.edu email addresses, and 2) stores all communications from instructors in chronological order under the “Announcements” tab on Blackboard Learn.

Course Website: <https://mycourses.purdue.edu/>

The course webpage is hosted by Blackboard Learn. When you login to Blackboard you should automatically have access to the webpage. The webpage will contain: overheads from presentations given in lecture, in-class exercises, lab assignments and data sets, homework assignments, supplemental readings, exam review sheets, etc.

Required Text:

Howell, D. C. (2013). Statistical Methods for Psychology (8th edition). Belmont, CA: Thomson Wadsworth.

Textbook webpage: <http://www.uvm.edu/~dhowell/methods8/>

Additional required readings will be posted on the course webpage.

Useful Supplemental Texts:

Acock, Alan C. (2018). A Gentle Introduction to Stata. 6th Ed. Stata Press.

Course Components:

Readings: Reading assignments include readings from the textbook as well as supplemented course readings, which will be provided on the course webpage. Reading assignments will be given during class and through the listserv. While reading about statistics may be unappealing, it will greatly help with your understanding of the material presented in class. Therefore, I encourage you to keep up with the reading. It is best to read statistics in shorter sections rather than reading through entire chapters in one sitting.

Homework: There will be approximately seven or eight homework assignments over the course of the semester. These generally involve application of class topics to real data using statistical software. The focus will be on proper application and interpretation of statistical analyses, but will also include some calculations and problem solving. You may work together with others on assignments, but you should produce your own assignment, particularly with respect to written components. Homework will account for 40% of your final grade. Your lowest homework grade will be dropped from the cumulative homework grade.

Statistical Software: We will learn how to analyze data using Stata. This packages will be used for lab assignments and most of the homework assignments. Stata is available in all ITaP instructional labs across campus as well as through software remote. Also, Stata software may be obtained through Purdue Software Distribution for your personal computers.

Exams: There are two exams during the course of the semester. Each exam will represent 20% of your final grade. A major component of the exams will be interpretation of statistics we learn about in the class in short answer format.

Final Paper: There is a final research paper for this course. The paper will focus on methods and therefore will not include a full literature review. The paper will include a short introduction, a description of the questions and hypotheses to be tested, a detailed description of the methods used, a detailed description of the results, and conclusions. More details on this assignment will be provided later in the semester. You may use a data set of your choosing. I will ask that you choose a data set about two-thirds the way through the semester. The final paper will represent 20% of your final grade.

Grading: Your grade will be weighted based on the following course component percentages:

Homework:	40%
Exam I:	20%
Exam II:	20%
Final Paper:	20%

Final grades will be assigned according to the following scale:

A+:	> 97%
A:	93 – 97%
A-:	90 – 92%
B+:	87 – 89%
B:	83 – 86%
B-:	80 – 82%
C+:	77 – 79%
C:	73 – 76%
C-:	70 – 72%
D:	< 70%
F:	< 60%

Holiday Schedule:

Students will not be expected to do course-related work on university-recognized holidays (i.e., Labor Day, Thanksgiving Day). If other significant holidays or observances related to your background, identity, and/or religious practices overlap with assignment due dates, please contact me and we can make a plan to work around your observances.

Accommodations:

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on different abilities or disabilities, you are welcome to let me know so that we can discuss options for making accommodations for you. You are also encouraged to contact the **Disability Resource Center (DRC)** by email at drc@purdue.edu, by phone at (765)-494-1247, or in person at Young Hall, 155 S. Grant St., Room 830, West Lafayette, IN 47907.

Non-Discrimination:

Purdue University and this instructor are committed to maintaining a community which values the worth and dignity of every person and fosters sensitivity, understanding, and mutual respect among its members. We will not tolerate discrimination on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran.

Psychological Health and Wellness:

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)-494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or at the Purdue University Student Health Center (PUSH) during business hours.

Academic Integrity:

- Academic integrity is among the highest values held by Purdue University. Individuals are encouraged to alert university officials to potential breaches of this value by email at integrity@purdue.edu or by phone at 765-494-8778. Information may be submitted anonymously.
- All work turned into the instructor for course credit must be original. In addition to a failing grade for the assignment, the penalties for academic dishonesty may consist of: a failing final grade (i.e., “F”) for the course, academic probation or other university sanctions, or even suspension or expulsion from the university, in some cases.
- Students who are suspected of any form of cheating or plagiarism will also be reported to the Office of the Dean of Students. Please review the university policies regarding academic integrity at: <http://www.purdue.edu/ODOS/osrr/integrity.htm>

“As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together, we are Purdue.” – Purdue University Code of Honor

Campus Emergencies:

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. I will try to send out messages through the class listserv and course webpage regarding emergencies affecting our class. Also, get information about changes in this course on the course Blackboard web page or email me at slchrist@purdue.edu.

Emergency information and updates will be posted on Purdue's homepage at <http://www.purdue.edu>

Students should sign up for emergency text messages here: https://www.purdue.edu/newsroom/health_safety/mail.html

Also, the following webpage details university policies and procedures during various emergency events: https://www.purdue.edu/emergency_preparedness/flipchart/index.html.

Schedule:

The tentative schedule of topics is provided below. There will inevitably be changes to this schedule due to the pace we can successfully complete each topic. I will provide updated schedules as we move through the course topics.

Tentative Schedule

Week	Topics Covered
Aug. 22, 24 & 25	Course Overview, Basic Concepts Learning Stata
Aug. 27, 29 & 30	Learning Stata
Sept. 3, 5 & 6	Describing & Exploring Data The Normal Distribution
Sept. 10, 12 & 13	Sampling Distributions and Hypothesis Testing Probability Concepts
Sept. 17, 19 & 20	Categorical Data and Chi-Square
Sept. 24, 26 & 27	Hypothesis Tests Applied to Means Power & Effect Size
Oct. 1, 3 & 4	Power & Effect Size Correlation and Regression
Oct. 8	FALL BREAK – NO CLASS

Tentative Schedule

Week	Topics Covered
Oct. 10 & 11	Review for Exam I
Oct. 15	EXAM I
Oct. 17 & 18	Simple ANOVA
Oct. 22, 24 & 25	Multiple Comparison Among Treatment Means (Multiple Testing) Factorial ANOVA
Oct. 29, 31, & Nov. 1	Factorial ANOVA
Nov. 5, 7 & 8	Repeated Measures ANOVA
Nov. 12, 14 & 15	Multiple Regression
Nov. 19, 21, & 22	ANCOVA and GLM (the General Linear Model) if time permits Review for Exam II
Nov. 26	EXAM II
Nov. 28 & 29	THANKSGIVING BREAK – NO CLASS
Dec. 3, 5, & 6	Computing Labs - Help with Final Papers
Dec. 12	FINAL PAPER DUE BY 5 P.M. EMAIL TO slchrist@purdue.edu

EMERGENCY PREPAREDNESS SYLLABUS ATTACHMENT

EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- Indoor Fire Alarms mean to stop class or research and immediately evacuate the building.
 - Proceed to your Emergency Assembly Area away from building doors. Remain outside until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- All Hazards Outdoor Emergency Warning Sirens mean to immediately seek shelter (Shelter in Place) in a safe location within the closest building.
 - “Shelter in place” means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, an active threat including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency*. Remain in place until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

*In both cases, you should seek additional clarifying information by all means possible...Purdue Emergency Status page, text message, Twitter, Desktop Alert, Albertus Beacon, digital signs, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html

EMERGENCY REPOSE PROCEDURES:

- Review the Emergency Procedures Guidelines at: https://www.purdue.edu/emergency_preparedness/flipchart/index.html
- Review the Building Emergency Plan (available on the Purdue Emergency Preparedness website or from the Building Deputy) for:
 - Evacuation routes, exit points, and emergency assembly area
 - When and how to evacuate the building
 - Shelter-in-place procedures and locations
 - Additional building-specific procedures and requirements.

EMERGENCY PREPAREDNESS AWARENESS VIDEOS

- “Run. Hide. Fight. ®” is a 6-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See: http://www.youtube.com/watch?v=5mzl_5aj4Vs (Link also located on the Purdue Emergency Preparedness website)

MORE INFORMATION

- Reference the Emergency Preparedness website for additional information: https://www.purdue.edu/ehps/emergency_preparedness/