SOC 382: Introduction to Statistics in Sociology

Brian L. McPhail

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E-mail: bmcphail@purdue.edu Web: purdue.brightspace.com
Office Hours: Tues. & Thurs. 1:00-3:00 p.m. on Slack Class Hours: N/A
Office: G13 Heavilon Hall Class Room: purdue.brightspace.com

(Syllabus updated: 6/16/2020)

Course Description

This course introduces students to foundational statistical concepts and basic quantitative methods used in social science research. Students will learn core principles of statistical inference, methods for summarizing and interpreting quantitative survey data, and basic programming skills for practical analysis of real social data. Quantitative data analysis and statistical literacy are essential skills for social science research and are useful for post-graduate careers. The course will follow a "learning-by-doing" approach and will emphasize first-hand experience in applying statistical concepts and analyzing/interpreting data. Students will learn how to use the open-source software R, a popular statistical programming environment.

Learning Outcomes

1. Understand how quantitative data and statistics are used to answer social science research questions.
2. Summarize quantitative social science data by calculating and interpreting basic descriptive statistics.
3. Summarize quantitative social science data by creating and interpreting data visualizations.
4. Understand and apply the basic concepts of sampling & inferential statistics.
5. Use the statistical software R for basic numerical and visual analysis of social science data.

Required Texts

Diez, David, Mine Çetinkaya-Rundel, and Christopher Barr. 2019. *OpenIntro Statistics*. Fourth Edition. ISBN: 978-1943450077 (This text is available to download for free online. A hard copy can be purchased online for $20.)

Gillespie, Brian Joseph, Kathleen Charli Hibbert, and William E. Wagner. 2020. A Guide to R for Social and Behavioral Science Statistics. 1 edition. Thousand Oaks, California: SAGE Publications, Inc. ISBN: 978-1544344027 (Paperback or ebook versions are available for purchase or rent online for about $45 or less. I recommend the paperback version as the ebook is poorly formatted.)

Additional required readings will be posted in Brightspace.

Course Tools

Brightspace D2L

Brightspace D2L is our course learning management system. This is where all of the course content will be posted and where you will submit assignments. It is strongly suggested that you explore and become familiar not only with the site navigation, but also with the content and resources available for this course. Take note of the University Resources side panel which includes information about Student Help and Success, Accessibility, and University Policies.

R

In this course we will use the open-source statistical software R (http://www.r-project.org) on the free RStudio Cloud platform —- a cloud-based user interface that simplifies many common R operations. A variety of resources will be used to help you learn the basics of R as efficiently as possible. Throughout the course, you will use RStudio Cloud "projects" for data analyses including following along with textbook examples and completing lab exercises and research briefs.

Slack

All course communication will take place in Slack at our course workspace: soc382iss.slack.com/. Email should **NOT** be used for this course! Slack is a cloud-based platform that is used for project management, information sharing, individual and group communication, as well as synchronous and asynchronous collaboration. We will use it to facilitate efficient and effective interactions about the course as well as to help us be more connected and accessible to one another.

Course Requirements & Grading

Assignments	Points
Discussion/Participation/Slack	50 pts
Quizzes (6 x 25 pts)	150 pts
Problem Sets (6 X 25 pts)	150 pts
Lab Exercises (6 X 25 pts)	150 pts
Research Briefs (4 x 125 pts)	500 pts
Total	**1000 pts**

A+	97.0% to 100.0%	C+	77.0% to 79.9%
A	93.0% to 96.9%	C	73.0% to 76.9%
A-	90.0% to 92.9%	C-	70.0% to 72.9%
B+	87.0% to 89.9%	D+	67.0% to 69.9%
B	83.0% to 86.9%	D	63.0% to 66.9%
B-	80.0% to 82.9%	D-	60.0% to 62.9%

Activities and Assessments

The following activities and assessments are designed to help you successfully achieve the course learning objectives.

Participation - 5%

Your contributions on Slack will play an important role in the success of the course. Not only will you get more out of the course but so will your classmates. Because we are not together in a classroom, efficient and effective communication with one another is imperative. Ask questions, reply to messages, and promote discussion. In other works, participate! It is also expected that you regularly check Slack for announcements, important threads, and other course information. Set your Slack notifications appropriately!

Quizzes - 15%

Quizzes will assess your understanding of statistical concepts and to help you know which areas you might need to spend more time and effort on. Each week you will complete an online quiz in Brightspace covering the course material for that week. Each quiz will be worth 25 points and include ~10-20 questions (drawn randomly from a bank of questions). You can take each quiz up to three times (you may get different questions on each quiz) and your highest score will be recorded. **Quizzes are due on Wednesdays by 11:59pm ET.** You are encouraged to read/watch and review that week's course materials prior to starting the quiz. Feel free to use your textbook and other course materials during the quizzes; however, you are expected to complete the quizzes on your own without the help of others.*Your lowest quiz score will be dropped.*

Problem Sets - 15%

Problem sets will reinforce your understanding of statistical concepts and your ability to apply them. Each week, the problem set will consist of specified even-numbered problems from the *OpenIntro* textbook. You may find it helpful to practice similar odd-numbered problems (solutions are in the back of the textbook). You will submit your answers to these problems by uploading them to Brightspace. **Problem sets are due on Fridays by 11:59pm ET.** *Your lowest score will be dropped.*

Lab Exercises - 15%

Lab exercises give you hands-on experience conducting data analysis using modern statistical software. The goal of each lab is to guide you in applying statistical concepts with real data and introduce you to important analysis tools in RStudio Cloud. Each lab excercise consist of two parts: 1) a guided practice analysis with detailed instructions and 2) an "own your own" analysis in which you use what you've learned. You will complete these lab exercises in RStudio Cloud and submit in Brightspace. **Lab exercises are due on Fridays by 11:59pm ET.** Detailed instructions for each lab are available in Brightspace. *Your lowest score will be dropped.*

Research Briefs - 50%

Research briefs give you a chance to apply what you've learned to answer research questions of interest to you. For each research brief, you will choose your own research topic to examine using the concepts, methods, and tools that you learn in this course. Using the General Social Survey 2018 dataset, you will select variables, conduct statistical analyses in RStudio Cloud, and briefly summarize and interpret your findings. Research briefs should be no more than 500 words and will be submitted in Brightspace. **Research Briefs are due on Wednesdays at 11:59pm ET** (except Research Brief #4). You will complete a total of four research briefs (each worth 125 points). The final research brief will be due during the last week of the course in lieu of a final exam (you're welcome!). Research briefs can be revised and resubmitted once within 7 days to earn back missed points (except Research Brief #4); revisions are optional.

Missed Assignment/Late Work Policy

I do not generally accept late work, so please plan accordingly. If you encounter technical problems with the Brightspace quizzes, please contact me at least an hour before the quiz closes.

Important Note

Course requirements, deadlines, and grading percentages are subject to change so as to best meet the educational objectives of the course. Any revisions will be announced with reasonable notice and if necessary a revised version of the syllabus will be posted in Brightspace. You are expected to check the Slack announcements channel regularly for course updates.

Course Evaluation

At the end of term, you will be asked to evaluate this course and instructor using Purdue's online course evaluation system. You will receive an official email from administrators with a link to the online evaluation site and have up to two weeks to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate.

Academic Success Resources

Purdue's Academic Success Center provides a variety of helpful resources designed to help undergrads meet their personal academic goals. They have handouts with tips for boosting your study skills, developing time-management strategies, taking better notes, etc. You can find these resources at: https://www.purdue.edu/asc/resources/allHandouts.html. For some tips on Learning Remotely, visit https://www.purdue.edu/innovativelearning/learning-remotely/quick-start.aspx.

Academic Integrity

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, Student Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

See Purdue's student guide for academic integrity for additional information: https://www.purdue.edu/odos/academic-integrity/.

The Purdue Honor Pledge: "**As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.**"

Student Well-Being

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 through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack, https://purdue.welltrack.com/.

Emergencies

In the event of a major university 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. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructor. You are expected to read your @purdue.edu email on a frequent basis.

See the University's website for additional information: https://www.purdue.edu/ehps/emergency_preparedness/.

Accessibility and Accommodations

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center by email at drc@purdue.edu or by phone: 765-494-1247.

Nondiscrimination

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University prohibits discrimination against any member of the University community 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. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, which provides specific contractual rights and remedies. Any student who believes they have been discriminated against may visit University's website (www.purdue.edu/report-hate) to submit a complaint to the Office of Institutional Equity. Information may be reported anonymously.

See Purdue's nondiscrimination statement: http://www.purdue.edu/purdue/ea_eou_statement.html.

Class Schedule

Week 1: Introduction to R & Data

Week 2: Summarizing Data & Distributions of Variables

Week 3: Foundations for Inference

Week 4: Inference for Categorical Data

Week 5: Inference for Numerical Data

Week 6: Correlation & Linear Regression

Week 7: Multiple Regression

Week 8: Review