

Course Syllabus: SI 340. Experiment Design and Analysis

Instructor: Yan Chen, 4348 North Quad, yanchen@umich.edu

Office hours: Monday and Tuesday: 4-5 p.m. at 4348 North Quad, and by appointment

GSI: Jaron Cordero, jcorde@umich.edu

Office hours: Wednesday and Friday 3:30-5:00 pm at Lorch 117

Instructional Aide: Austin McCall, mccallau@umich.edu

Available to meet: Thursday 3-6 p.m. at 1243 North Quad, Friday 2-5 p.m. at 1274 North Quad

Please note that Austin will use a weekly sign-up sheet and meet with students who sign up for his slots for that week.

Meets: Monday 1-4 pm, Room 1255 North Quad;

Course Overview and Objectives: This course is an introduction to experiment design and some of the major subject areas in the study of information that use laboratory and field experiments. We will discuss the logic of experimentation, its strengths and weaknesses compared to other methodologies, and the ways in which experimentation has been – and could be – used to investigate social phenomena. Students will learn how to interpret and design experiments, and analyze experimental data. Special attention will be devoted to field experiments, or randomized trials, or A/B testing conducted in real-world settings. Students are introduced to experimental methodology through lectures, by participating in interactive in-class experiments and demonstrations, critically reading and discussing related research papers and eventually designing and (optionally) implementing their own experiment.

Prerequisite: Students should have completed at least one undergraduate statistics class at the level of Stats 250.

Recommended Text:

- *Running Randomized Evaluations: A Practical Guide* by Rachel Glennerster and Kudzai Takavarasha (shortened as *RE*). The textbook website can be found here: <http://runningres.com/>.
- Papers will be accessible from Canvas.

Course Requirements:

- **Homework assignments 40%:** There will be approximately 10 homework assignments. Assignments will be posted on and submitted through Canvas. In order to receive credit for a homework assignment, you must turn it in on time. Each homework assignment is graded on a 10-point scale. Late homework will not be accepted. At the end of the semester, we will drop your lowest homework score.
- **Midterm 20%:** There will be an in-class midterm on March 18, 2019. It is closed-book and closed-notes, but you will be allowed to have a 2-sided “cheat sheet” and a non-graphical calculator. The midterm will be one hour and 30 minutes long, held during regular lecture hours in the regular classroom.

You are responsible for attending midterm. No make-ups will be held except for students with a medical excuse from a doctor.

- **Presentation of experiment design 10%:** after the midterm, students will be asked to design an experiment. You can form a team of 2-3 students and work together on this project. Student presentations will be during our regular lectures.
- **Final paper 20%:** due at 5:00 p.m. on 4/25/2019.
- **Class participation 10%:** During the course, we will run a number of in-class experiments to demonstrate several common measurements in lab experiments. Your earnings in the experiments will be normalized and counted at the end of the course. Thus, you will want to earn as many bonus points as possible. Your participation in these experiments and your participation during class discussion will count towards your participation grade.

- **Grading:**

- A range: 96 and up = *A+*; [92, 96) = *A*; [88, 92) = *A-*;
- B range: [84, 88) = *B+*; [80, 84) = *B*; [76, 80) = *B-*;
- C range: [72, 76) = *C+*; [68, 72) = *C*; [63, 68) = *C-*;
- D range: [59, 63) = *D+*; [55, 59) = *D*; [50, 55) = *D-*;
- E range: Below 50 = *E*.

NOTE: CANVAS will provide scores for individual assignments, but it will NOT reflect your final course percentage. Canvas does not drop the lowest homework score nor add in the bonus points.

Accommodations for Students with Disabilities: If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734-763-3000; <http://ssd.umich.edu/>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information you provide as private and confidential.

The planned schedule of the course is as follows. Adjustments may be made based on student interest and discussion.

Week 1. (1/14) Introduction: the importance of experimentation;

RE: chapter 1.

*Smith, Vernon (1982). "Microeconomic Systems as an Experimental Science," *American Economic Review* 72: 923-955.

*Harrison, Glenn, and John List. "Field Experiments." *Journal of Economic Literature* 2004.

Chen, Yan and Joseph Konstan. Online Field Experiments: A Selective Survey of Methods. *Journal of the Economic Science Association* 1 (1): 29-42. July 2015.

Experiment: first-price and second-price sealed bid auctions

Week 0. (1/21) MLK Day - no class.

Week 2. (1/28) Randomization and independence; Individual choice under uncertainty.

RE: chapter 2.

*Kahneman, Daniel and Amos Tversky. "Prospect Theory: An Analysis of Choice under Risk." *Econometrica* 47(2): 263-91, 1979.

*Holt, Charles and Susan Laury. "Risk Aversion and Incentive Effects." *American Economic Review* 93: December 2002.

List, John A. (2004). Neoclassical Theory Versus Prospect Theory: Evidence from the Marketplace. *Econometrica* 72 (2): 615-625.

Experiment: Holt and Laury Lottery Experiment (vecon lab);

Week 3. (2/4) Asking the right questions; Bargaining, Altruism, Fairness;

RE: chapter 3.

Guth, Werner, R. Schmittberger, and B. Schwartz. An Experimental Analysis of Ultimatum Bargaining. *Journal of Economic Behavior and Organization*, December 1982, 3(4), pp. 367—88.

Forsythe, Robert, Joel Horowitz, N.S. Savin and Martin Sefton. Fairness in Simple Bargaining Games. *Games and Economic Behavior* May 1994, 6(3), pp. 347—69.

Experiment: dictator and ultimatum games

Week 4. (2/11) Randomizing, Blocking and Clustering; Trust, social capital, security

RE: chapter 4.1, 4.2, 4.5

*Berg, Joyce, John Dickhaut and Kevin McCabe, Trust, Reciprocity, and Social History, *Games and Economic Behavior*, Volume 10, Issue 1, July 1995, Pages 122-142,

*Karlan, Dean. Using Experimental Economics to Measure Social Capital and Predict Financial Decisions. (December 2005) *American Economic Review*, 95(5), pp. 1688-1699.

Gary Bolton, Ben Greiner, and Axel Ockenfels. Engineering Trust: Reciprocity in the Production of Reputation Information. *Management Science* December 10, 2012.

Chen, Yan, Iman Yeckehzaare and Ark Fangzhou Zhang. “Real or Bogus: Using Economic Experiments to Predict Susceptibility to Phishing.” *PLOS ONE* 13(6): e0198213. June 2018.

Experiment: trust game and MobLab bundle of games

Week 5. (2/18) Outcomes and Instruments; Public goods and social Preferences.

RE: chapter 4.3, 4.4;

*Charness, Gary and Matthew Rabin. “Understanding Social Preferences with Simple Tests.” *Quarterly Journal of Economics*, 117, August, 2002, 817-869.

Dean Karlan and John List. Does Price Matter in Charitable Giving? Evidence from a Large-Scale Natural Field Experiment, *American Economic Review*, December 2007.

*Yan Chen, Rosta Farzan, Robert Kraut, Iman YeckehZaare and Ark Fangzhou Zhang. “Motivating Contributions to Public Information Goods: A Personalized Field Experiment on Wikipedia.” Working paper, 2018.

Experiment: public goods

Week 6. (2/25) Statistical power; Stereotypes and discrimination

RE: chapter 6.

*Bertrand, Marianne and Sendhil Mullainathan. Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *The American Economic Review*, Vol. 94, No. 4 (Sep., 2004), pp. 991-1013.

*Fershtman, Chaim and Uri Gneezy. Discrimination in a Segmented Society: An Experimental Approach. February 2001, QJE Vol. 116, No. 1, Pages 351-377.

Bohren, Aislinn, Alex Imas and Michael Rosenberg. “The Dynamics of Discrimination: Theory and Evidence,” Conditionally accepted at *American Economic Review*. 2018.

Experiment: statistical discrimination

Week 7. (3/11) midterm review; Information nudges.

*Ferraro, PJ, M Price. Using Non-pecuniary Strategies to Influence Behavior: evidence from a large-scale field experiment. *The Review of Economics and Statistics* 2013.

In addition, read the following article, which we will use in class to illustrate use of DID estimators:

*Chen, Yan, Maxwell Harper, Joseph Konstan and Xin Li (2010). Social Comparisons and Contributions to Online Communities: A Field Experiment at MovieLens. *American Economic Review* 100(4): 1358—98.

*Chen, Yan, Fangwen Lu and Jinan Zhang. “Social comparisons, status and driving behavior.” *Journal of Public Economics* 155: 11-20. November 2017.

SBEE speaker: Annie Liang, University of Pennsylvania

Week 8. (3/18) In-class Midterm;

Lewis, R. and Rao, J.M. The unfavorable economics of measuring the returns to advertising. *Quarterly Journal of Economics* 2015.

Week 9. (3/25) Threats; Social Networks

RE: chapter 7.

Jeffrey Travers and Stanley Milgram. An Experimental Study of the Small World Problem. *Sociometry* Vol. 32, No. 4 (Dec., 1969), pp. 425–443.

Leider, Stephen, Mobius, Markus M., Rosenblat, Tanya and Do, Quoc-Anh, Directed Altruism and Enforced Reciprocity in Social Networks: How Much is a Friend Worth? *Quarterly Journal of Economics* Vol. 124, no. 4 (Nov. 2009): 1815 – 1851.

SBEE speaker: Chen Cheng, Johns Hopkins University

Week 10. (4/1) Analysis; Social identity and team competition

RE: chapter 8.

*Akerlof, George and Kranton Rachel (2000). Economics and Identity. *Quarterly Journal of Economics* 115 (3), 715–753.

Eckel, C. and Grossman, P. (2005). Managing diversity by creating team identity. *Journal of Economic Behavior & Organization* 58, 371-92.

*Ai, Wei, Roy Chen, Yan Chen, Qiaozhu Mei and Webb Phillips. "Recommending teams promotes prosocial lending in online microfinance." *Proceedings of the National Academy of Sciences* 113 (52): 14944-14948. December 2016.

Chen, Roy, Yan Chen, Yang Liu and Qiaozhu Mei. "Does Team Competition Increase Pro-Social Lending: Evidence from Online Microfinance." *Games and Economic Behavior* 2017.

SBEE speaker: Heather Sarsons, University of Toronto

Week 11. (4/8) Drawing policy lessons; Gender

RE: chapter 9.

Niederle, Muriel. "Gender." *Handbook of Experimental Economics*, second edition, Eds. John Kagel and Alvin E. Roth, Princeton University Press, 2016, pp 481-553.

Niederle, Muriel, and Lise Vesterlund. "Do Women Shy away from Competition? Do Men Compete too Much?," *Quarterly Journal of Economics*, August 2007, Vol. 122, No. 3: 1067-1101.

Exley, Christine L., Muriel Niederle and Lise Vesterlund, "Knowing When to Ask: The Cost of Leaning In," *Journal of Political Economy* forthcoming.

SBEE speaker: Songfa Zhong, National University of Singapore

Week 12. (4/15) Reproducibility

Martin Goodson (2014). Most Winning A/B Test Results Are Illusory.

Gerber, Alan S. and Neil Malhotra. 2008. Do Statistical Reporting Standards Affect What is Published? Publication Bias in Two Leading Political Science Journals. *Quarterly Journal of Political Science* (3): 313-326.

Simonsohn, Uri and Nelson, Leif D. and Simmons, Joseph P., P-Curve: A Key to the File Drawer. *Journal of Experimental Psychology: General*.

Open Science Collaboration. 28 August 2015. Estimating the reproducibility of psychological science. *Science*: Vol. 349 no. 6251. DOI: 10.1126/science.aac4716

SBEE speaker: Wes Hutchinson, University of Pennsylvania

Week 13. (4/22) Student Presentations

SBEE speaker: Mandy Pallais, Harvard University