

Course Syllabus for SIADS 688: Data Science for Social Good

Course Overview and Prerequisites

This course analyzes the motivations and incentives for people to contribute to public goods. Students will learn how to apply causal inference techniques and social science theories to nudge pro-social behavior. Application domains include energy conservation, safe driving, contributions to open content (Wikipedia), open source, and P2P online microfinance.

The prerequisites for SIADS 688 include:

- Preceded or accompanied by SIADS 630, 631, and 694; (C- or better)

Instructor and Course Assistants

Instructor: Yan Chen, yanchen@umich.edu

Course Assistant: Linfeng Li (GSI)

Course Communication Expectations

To contact the instructor or course assistant: Course channel in Slack

Slack response time: Questions that are posted on the Slack channel during the day will be answered by 11 p.m. of the day.

Email response time: 24 - 48 hours

How to Get Help

If you have questions concerning the degree program, encounter a technical issue with Coursera, or issues using Slack, please submit a report to the ticketing system at umsimadshelp@umich.edu.

If you have an issue specific to the Coursera environment, you can also begin a [live chat session](#) with Coursera Technical Support (24/7) or view [Coursera troubleshooting guides](#). (you may be asked to log in to your Coursera account).

For questions regarding course content, refer to the **Communications Expectations** section below.

Weekly Readings

All readings are located within Coursera as links. In some cases, you may be directed to the U-M Library website and need to sign-in using your U-M email address and password..

Week 1 - Digital Public Goods and Externalities: Nudging Safe Driving

- Chen, Yan, Fangwen Lu and Jinan Zhang (2017). "Social comparisons, status and driving behavior." *Journal of Public Economics* 155: 11-20.
- Chen, Y. (2020). *Digital Public Goods*. Chapter 1.
- Ariely, Dan, Anat Bracha, and Stephan Meier. 2009. Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially. *American Economic Review* 99 (1): 544-55.

Week 2 - Information Nudges for Energy Conservation

- Tiefenbeck, Verena, Lorenz Goette, Kathrin Degen, Vojkan Tasic, Elgar Fleisch, Rafael Lalive, and Thorsten Staake. Overcoming Salience Bias: How Real-Time Feedback Fosters Resource Conservation. *Management Science* 2018, 64:3, 1458-1476. (Open access)

- Ferraro, Paul J and Michael Price. Using Non-pecuniary Strategies to Influence Behavior: evidence from a large-scale field experiment. *The Review of Economics and Statistics* 2013.
- Tiefenbeck, Verena, et al. Real-time feedback promotes energy conservation in the absence of volunteer selection bias and monetary incentives. *Nature Energy* 4, 35–41 (2019). <https://doi.org/10.1038/s41560-018-0282-1>

Week 3 - Social Identity for Social Good

- 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* 101: 311-333. January 2017.
- Ren, Yuqing, Jilin Chen, and John Riedl. The Impact and Evolution of Group Diversity in Online Open Collaboration. *Management Science* 2016 62:6, 1668-1686

Week 4 - Personalizing the Ask: Open Content, Recommender, and Reputation Systems

- Yan Chen, Rosta Farzan, Robert Kraut, Iman YekkehZaare and Ark Fangzhou Zhang. “Motivating Experts to Contribute to Digital Public Goods: A Personalized Field Experiment on Wikipedia.” *Under R&R for Management Science*.
- Bohren, Aislinn, Alex Imas and Michael Rosenberg. (2019) “The Dynamics of Discrimination: Theory and Evidence,” *American Economic Review* 109 (10): 3395-3436.

Learning Outcomes

- Recognize the class of mechanisms that would be appropriate to nudge pro-social behavior, such as social comparison, goal setting, leader boards, and team competition;
- Evaluate the impact of such mechanisms either through a field experiment (RCT) or other exogenous policy changes; and
- Know when to and when not to apply a specific causal inference technique, such as instrumental variables, regression discontinuity design, and difference-in-differences analysis

Course Schedule

- **This course begins on Wednesday, March 31 at 3:00 am and ends on Tuesday, April 27 at 11:59 pm.**
- Weekly assignments will be **due on Tuesdays at 11:59 pm** (Ann Arbor, Michigan time-Eastern Daylight Time - EDT, UTC -4).
- Office hours will be held at the following times
 - Mondays at 8 am EDT
 - Fridays at 4 pm EDT
 - Saturdays at 4 pm EDT

Weekly Office Hours via Zoom (Ann Arbor, Michigan time):

Your instructor will hold weekly, synchronous office hours using the video-conferencing tool, Zoom. The schedule of office hours can be found by clicking on the **Live Events** link in the left-hand navigation menu.

Assignments and Grading

You are expected to read an assigned paper on Perusall before watching each lecture, and complete a problem set afterwards.

- Weekly (4) Perusall reading assignments are each worth 5% of your total grade
- Data problem sets (3) are each worth 20% of your total grade
- The final paper in Week 4 is worth 20% of your grade

Data Problem Sets

Assignment 1

- Analysis of a data set from a field experiment using social information intervention to reduce traffic violations (Chen et al. 2017).
- The data set contains the traffic violation record of 395,204 cars over a 10-month period in 2013 in Tsingtao, China. The researchers implemented their intervention at the end of the 9th month, and used the 10th month data for impact evaluation.
- Techniques: Poisson regressions, clustering of standard errors

Assignment 2

- Analysis of a field experiment designed to nudge people to reduce their water usage (Ferraro and Price 2013).
- The data set comes from a field experiment in the metro Atlanta area.
- Techniques: Heterogeneous treatment effects, impact evaluation

Assignment 3

- Analysis of two Kiva data sets to practice the use of instrumental variable regressions.
- The data sets for Ai et al. (2016) contains an intervention that evaluate the effects of team membership on prosocial lending. To argue for exclusion restriction, one needs to use the Chen et al. (2017) data set.
- The data sets contain Kiva lending activities from two field experiments.
- Techniques: Instrumental variable regressions, inclusion and exclusion restrictions

Note: All assignments are required to earn credit for this course.

Original Work Policy

Collaboration: I strongly encourage collaboration while working on homework problems. Active learning is effective.

Collaboration will be especially valuable in summarizing the reading materials and picking out the key concepts. You must, however, write your homework submission on your own, in your own words, before turning it in. If you work with someone on the homework before writing it, you must list any and all collaborators on your written submission.

Plagiarism: All written submissions must be your own, original work. Original work for narrative questions is not mere paraphrasing of someone else's completed answer: you must not share written answers with each other at all. At most, you should be working from notes you took while participating in a study session. Largely duplicate copies of the same assignment will receive an equal division of the total point score from the one piece of work. You may incorporate selected excerpts from publications by other authors, but they must be clearly marked as quotations and must be attributed. If you build on the ideas of prior authors, you must cite their work. You may obtain copy editing assistance, and you may discuss your ideas with others, but all substantive writing and ideas must be your own, or be explicitly attributed to another. See the [Rackham Graduate policy on Academic and Professional Integrity](#) for the definition of plagiarism, and associated consequences.

Letter Grades, Course Grades, and Late Submission Policy

If you are late submitting an assignment, the following late policy will typically apply: 15% reduction if assignment is turned in one day late, 30% reduction if two days late, 45% reduction if three days late, and a zero (0) if four or more days late.

The grading scale for this course is as follows:

A+	97%
A	93%
A-	90%
B+	87%
B	83%
B-	80%
C+	77%
C	73%
C-	70%
D+	67%
D	63%
D-	60%
F	0%

Academic Integrity/Code of Conduct

Refer to the [Academic and Professional Integrity](#) section of the UMSI Student Handbook (access to Student Orientation course required).

Accommodations

Refer to the [Accommodations for Students with Disabilities](#) section of the UMSI Student Handbook (access to the Student Orientation course required). Use the [Student Intake Form](#) to begin the process of working with the University's Office of Services 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. I will treat any information you provide as private and confidential.

Accessibility

Refer to the [Screen reader configuration for Jupyter Notebook Content](#) document to learn accessibility tips for Jupyter Notebooks.

Library Access

Refer to the [U-M Library's information sheet](#) on accessing library resources from off-campus. For more information regarding library support services, please refer to the [U-M Library Resources](#) section of the UMSI Student Handbook (access to the Student Orientation course required).

Student Mental Health

Refer to the University's [Resources for Stress and Mental Health website](#) for a listing of resources for students.

Student Services

Refer to the [Introduction to UMSI Student Life](#) section of the UMSI Student Handbook (access to the Student Orientation course required).

Technology Tips

- Recommended Technology
 - This program requires Jupyter Notebook for completion of problem sets and Adobe or other PDF viewer for reading articles.
- Working Offline
 - While the Coursera platform has an integrated Jupyter Notebook system, you can work offline on your own computer by installing Python 3.5+ and the Jupyter software packages, including pyspark. For more details, consult the Jupyter Notebook FAQ.