

Term Information

Effective Term Spring 2024

General Information

Course Bulletin Listing/Subject Area Economics
Fiscal Unit/Academic Org Economics - D0722
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 1101
Course Title Using Big Data to Solve Economic and Social Problems
Transcript Abbreviation UBDSESP
Course Description This course is designed to show how "big data" can address pressing social and economic challenges of today. The curriculum introduces students to the fundamentals of economics, regression analysis, and causal inference in an accessible manner without the need for prior knowledge in economics or statistics.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Lecture
Grade Roster Component Lecture
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites
Exclusions
Electronically Enforced No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 45.0601
Subsidy Level Baccalaureate Course
Intended Rank Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- 1) to introduce students to frontier social science research on key social and economic issues
- 2) to teach students how to analyze data using modern quantitative methods and basic programming techniques
- 3) to show students how practitioners are using data to analyze social problems

Content Topic List

- Part I: Inequality and Social Mobility
- Part II: Education
- Part III: Racial Disparities & Criminal Justice
- Part IV: Health
- Part V: Tax Policy
- Part VI: Economic Development and Institutional Change
- Part VII: Presentations and final

Sought Concurrence

Yes

Attachments

- Concurrence Request Email.jpeg
(Concurrence. Owner: Burnell, Sydneigh Morah)
- concurrence_request_form_AEDE_ECON1101.pdf
(Concurrence. Owner: Burnell, Sydneigh Morah)
- Concurrence Approval Email.jpeg
(Concurrence. Owner: Burnell, Sydneigh Morah)
- ECON-1101-Syllabus.pdf
(Syllabus. Owner: Burnell, Sydneigh Morah)

Comments

- Concurrence requested and received either directly or by default from the following departments: AEDE, Statistics, Sociology, Computer Science & Engineering, Geography, Anthropology, Psychology, Fisher College of Business *(by Burnell, Sydneigh Morah on 09/08/2023 01:45 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Burnell, Sydneigh Morah	09/14/2023 12:35 PM	Submitted for Approval
Approved	Yang, Huanxing	09/14/2023 01:10 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	09/14/2023 04:42 PM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Neff, Jennifer Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	09/14/2023 04:42 PM	ASCCAO Approval



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

Using Big Data to Solve Economic and Social Problems

Syllabus

ECON 1101 - Spring 2024

Course Information

Class Schedule and Delivery Mode

Course times and location: Tuesdays and Thursdays, 9:35 a.m. - 10:55 a.m. in XXX

Credit hours: 3

Mode of delivery: In person

Instructor

Alex Hollingsworth, Associate Professor

Contact information: hollingsworth.126@osu.edu, 614-555-5555 (Office)

Preferred modes of communication: My preferred method for questions is **email**. My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](#) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Office hours for student questions and support: Tuesdays and Thursdays, 11:00 a.m.-12:00 p.m. in XXX and via appointment.

Teaching Assistants

[First and last name, honorifics, pronunciation and/or preferred pronouns], [Department]

Contact information: lastname.#@osu.edu, 614-555-5555 (Office)

Course Description

This course is designed to show how "big data" can address pressing social and economic challenges of today. The curriculum introduces students to the fundamentals of economics, regression analysis, and causal inference in an accessible manner without the need for prior knowledge in economics or statistics. It is tailored for beginners in economics and data science, as well as for advanced learners looking to apply and enhance their previously acquired knowledge.

The course will introduce students to cutting-edge research and practical applications in economics and social science in an easy-to-understand format. Key topics span from equality of opportunity, education, and racial disparities to innovation, health care, climate change, criminal justice, and tax policy. The course will feature work

from renowned researchers and professionals who use big data in real-world applications.

Course Prerequisites

None

Learning Outcomes

This course has three principal learning objectives:

- 1) to introduce students to frontier social science research on key social and economic issues,
- 2) to teach students how to analyze data using modern quantitative methods and basic programming techniques, and
- 3) to show students how practitioners use data to analyze social problems.

Economics 1101 will achieve these learning outcomes by teaching students about the theories and methods of social scientific inquiry through discussion of social policy, data analysis, economics, regulation, and causal inference. The course is modeled after successful [Harvard course](#) and will attempt to teach economics like a laboratory science, showing students how to *do* economics rather than only presenting lectures about long-established results. This approach draws from pedagogical work by Mehta and Fine (2019) who find that in the most effective classes, “rather than touring students through the textbook, teachers invited students to participate in the authentic work of the field....For example, a skillful science teacher in a high-poverty-district high school offered a course in which her students designed, researched, carried out and wrote up original experiments.” This course seeks to apply this approach to teaching introductory empirical economics by discussing frontier research in lectures and having students engage in research themselves in labs and empirical projects. Students will complete four projects and take two in-person exams. These projects will engage critically with current events, social problems, public policies, and regulations. These projects will all involve the analysis of large datasets, as such students will be expected to show competency related to the use, understanding, and pitfalls of basic causal inference methods for social science.

Course Materials, Fees, and Technologies

Required Materials

- Readings of academic papers and related news articles will be made available and assigned via Canvas
- Supplemental readings that enrich our discussions of particular topics will often come from the following two textbooks, both of which are available as a free online eBooks
 - The Economy: Economics for a Changing World. 2017. Core Economics Education. ISBN: 978-0198810247
 - Available as a free eBook here, <https://www.core-econ.org/project/core-the-economy/>
 - The Effect. 2023. Nick Huntington-Klein, 2021. Chapman & Hall.
 - Available as a free eBook here, <https://theeffectbook.net>

- For library course materials and additional optional materials, refer to the CarmenCanvas course.

Fees and Additional Requirements

- All students must purchase a one semester membership to Posit Cloud, which is an online computing platform that allows us to use R and RStudio. All assignments will be completed using this platform. Using the same online platform ensures that we all have the same packages, instructions for use, and that any tutorials/help myself or the TAs provide will be equally valid for all students. The other nice thing about Posit Cloud is that it works well across all platforms (i.e., Mac, PC, iPad). The cost is roughly \$20 for the whole semester.

Technology

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at go.osu.edu/student-tech-access.

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection, webcam, and microphone
- **BuckeyePass:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week:

<https://it.osu.edu/students>

Grading and Evaluation

How Your Grade is Calculated

SCHEDULE FOR EXAMS AND EMPIRICAL PROJECTS

Assignment	Due date	Assignment Category	Points/Weight	Assignment Type
Project 1 part 1	11:59 p.m. on Thursday, 1/25	Projects	62.5	Independent work
Project 1 part 2	11:59 p.m. on Thursday, 2/8	Projects	62.5	Independent work
Project 2	11:59 p.m. on Thursday, 3/7	Projects	125	Independent work
Midterm exam	9:35-10:55 a.m. on Thursday, 3/5	Exams	225	Independent work
Project 3	11:59 p.m. on Thursday, 4/4	Projects	125	Collaboration optional

Project 4 part 1	11:59 p.m. on Thursday, 4/11	Projects	62.5	Collaboration optional
Project 4 part 2	11:59 p.m. on Thursday, 4/18	Projects	62.5	Collaboration optional
Final exam	Scheduled by the registrar for Tuesday, April XX at X:XX a.m.	Exams	225	Independent Work
Participation	Will be evaluated throughout semester	Participation	50	Independent Work

Descriptions of Major Course Assignments

There are 1000 points to be earned in the course

Projects (50% or 500 points)

Description: A key learning element of the course will be four empirical projects (each worth 12.5% of the final grade), which will give students hands-on experience in doing economics and working with data. We will teach and support the statistical software program R for these projects, but students are welcome to use other programs (e.g., SAS, SPSS, R, Python), provided that their code and work is clearly documented. The empirical projects are more substantial than traditional problem sets and will include significant coding, reading, and writing elements that will put students in the shoes of social scientists doing research. Out of classroom videos will be provided to provide the tools necessary to solve the empirical projects, and TA support will be provided as well. The fourth project will involve a presentation to the class and can be done as a group.

Mix of Independent work and collaboration optional (see above table)

Exams (45% or 450 points)

Description: There will be two in-class exams each worth 225 points, a mid-term and a final. Exams MUST be taken during the scheduled time period. Each exam will be timed and must be completed and submitted within the time period listed above. Makeup exams will not be granted for midterms and will be allowed for the final exam only for approved reasons. If you miss an exam without an accepted excuse, you will receive a zero. An accepted excuse is one that I have approved BEFORE the examination day. You must discuss any potential absences during exam dates before the day of the exam with me. If you have an accepted excuse (these must be brought to me beforehand except for sickness, injuries, accidents, etc) the points from a missed midterm exam grade will be added to your final exam. In the case of the final exam, if you have an accepted excuse, you will be allowed to take a make-up final exam. In this case, you must make arrangements with me as soon as possible to avoid receiving a zero. If you miss an exam and do not notify me beforehand you will receive a zero for the exam unless you provide documentation showing that you were unable to attend class. Documentation from a medical professional is required for absence during an exam for medical reasons. This documentation must recommend that you do not attend class. The note must specify the exam date. Again, in this case the points from the missed exam grade will be added to your final exam.

Independent Work

Participation (5% or 50 points)

Description: Participation and attendance in class is essential for your understanding of the material. While attendance of course is not explicitly graded, participation via Canvas polls, questions, and other similar activities will explicitly count towards your grade.

Independent work

Grading Scale

93–100: A	80–82.9: B-	67–69.9: D+
90–92.9: A-	77–79.9: C+	60–66.9: D
87–89.9: B+	73–76.9: C	Below 60: E
83–86.9: B	70–72.9: C-	

Course Schedule

This is a tentative schedule of the course, please refer to the CarmenCanvas course for up-to-date schedule and due dates. See below for reading list that corresponds to each reading number.

Date	Num.	Topic	Selected Methods	Reading/Graded Item Due
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Part I: Inequality and Social Mobility

1/9	1	The Geography of Upward Mobility in America	correlation, regression	Reading: #1
1/11	2	Causal Effects of Neighborhoods	Experiments	
1/16	3	Causal Effects of Neighborhoods and Characteristics of High-Mobility Areas	quasi-experiments	Reading: #2
1/18	4	Policies to Increase Upward Mobility		
1/23	5	Historical and International Evidence on the Drivers of Inequality and Mobility	cost-benefit analysis	Reading: #3
1/25	6	Historical and International Evidence on the Drivers of Inequality and Mobility- part 2		Due: Project 1, part 1
1/30	7	Upward Mobility, Innovation, and Growth	propensity score reweighting	Reading: #4

Part II: Education

2/6	8	Higher Education and Upward Mobility	regression discontinuity	Reading #5
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2/8	9	Primary Education	experiments	Due: Project 1, part 2
2/13	10	Teachers and Charter Schools	event study designs, competitive equilibrium	Reading #6

Part III: Racial Disparities & Criminal Justice

2/15	11	Racial Disparities in Economic Opportunity	dynamic models and steady states	Reading: #7
2/20	12	Racial Disparities in Economic Opportunity		
2/22	13	Improving Judicial Decisions	machine learning, implicit bias	Reading: #8

Part IV: Health

2/27	14	Improving Health Outcomes	Hazard models	
2/29	15	Review		
3/5		Midterm exam		In-class midterm #1
3/7	16	Improving Health Outcomes		Due: Project 2 Reading: #9
3/11-3/15		Spring break		
3/19	17	The Economics of Health Care and Insurance	adverse selection	Reading: #10
3/21	18	The Economics of Health Care and Insurance		
3/26	19	Environment and health	diff-in-differences, externalities, discount rates, external validity	Reading: #11

3/28 20 Environment and health

Part V: Tax Policy

4/2	21	Tax Policy 1: Income Taxation	supply & demand, synthetic control	Reading: #12
4/4	22	Tax Policy 2: Savings and Wealth	behavioral economics	Due: Project 3

Part VI: Economic Development and Institutional Change

4/9	23	Institutions and Economic Development	Historical data analysis	Reading: #13
4/11	24	Power of persistence		Due: Project 4, part 1

Part VII: Presentations and final

4/16	25	In-class presentations		
4/18	26	In-class presentations		Due: Project 4, part 2
4/XX		Final exam		

Reading List

This is a tentative reading list. Please see CarmenCanvas for an up-to-date reading list where supplemental readings will also be occasionally posted. Students are responsible for reading a small number of required papers (in bold with numbers below). Please focus on understanding the main ideas, rather than technical details. We recommend starting with non-technical summaries and introductions for this purpose. The other papers will be discussed in lecture, in section, or in the empirical projects, and may be useful references in those contexts.

Part I: Equality of Opportunity

Geography of Economic Mobility

1. **Chetty, Raj, John Friedman, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. 2018. "The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility." NBER Working Paper No. 25147. Non-technical summary.**

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States." *Quarterly Journal of Economics* 29 (4): 1553–1623. Non-technical summary.

Policies to Improve Upward Mobility

2. **Bergman, Peter, Raj Chetty, Stefanie DeLuca, Nathaniel Hendren, Lawrence F. Katz, and Christopher Palmer. 2019. "Creating Moves to Opportunity: Experimental Evidence on Barriers to Neighborhood Choice," NBER Working Paper No. 26164. Non-technical summary**

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review* 106 (4): 855–902. Non-technical summary

Chetty, Raj, and Nathaniel Hendren. 2018. "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects." *Quarterly Journal of Economics* 133(3): 1107-1162. Non-technical summary.

Dobbie, Will, and Roland G. Fryer Jr. 2011. "Are High-Quality Schools Enough to Increase Achievement among the Poor? Evidence from the Harlem Children's Zone," *American Economic Journal: Applied Economics*, 3 (3): 158-87.

Pollack, Craig E., Amanda L. Blackford, Shawn Du, Stefanie Deluca, Rachel J.L. Thornton, and Bradley Herring. 2019. "Association of Receipt of a Housing Voucher With Subsequent Hospital Utilization and Spending," *Journal of the American Medical Association* 322(21): 2115-2124.

Historical Trends

- Autor, David H. 2014. "Skills, education, and the rise of earnings inequality among the 'other 99 percent.'" *Science* 344(6186): 843-85.
- Berman, Yonatan. 2019. "The Long Run Evolution of Absolute Intergenerational Mobility." Working paper.
- Chetty, Raj, David Grusky, Maximilian Hell, Nathaniel Hendren, Robert Manduca, and Jimmy Narang. 2017. "The Fading American Dream: Trends in Absolute Income Mobility Since 1940." *Science* 356 (6336): 398-406. [Non-technical summary](#)
- Deming, David J. 2017. "The Growing Importance of Social Skills in the Labor Market," *Quarterly Journal of Economics* (132)4: 1593–1640.
- Goldin, Claudia and Lawrence Katz. 2010. *The Race Between Education and Technology* Belknap Press of Harvard University Press, Cambridge, Mass.
- Hendren, Nathaniel, and Ben Sprung-Keyser. 2020. "A Unified Welfare Analysis of Government Policies," *Quarterly Journal of Economics* (Forthcoming).
- Piketty, Thomas and Emmanuel Saez. 2003. "Income Inequality in the United States, 1913-1998." *Quarterly Journal of Economics* 118(1): 1-39.
- Saez, Emmanuel and Gabriel Zucman. 2016. "Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data." *Quarterly Journal of Economics* 131(2): 519-578.

Using Big Data to Measure and Understand Cities

Glaeser, Edward L., Hyunjin Kim, Michael Luca. 2019. "Nowcasting the Local Economy: Using Yelp Data to Measure Economic Activity," in *Big Data for 21st Century Economic Statistics*, eds. Abraham, Jarmin, Moyer, and Shapiro.

3. **Glaeser, Edward L., Scott Duke Kominers, Michael Luca, Nikhil Naik, 2018. "Big Data and Big Cities: The Promises and Limitations of Improved Measures of Urban Life," *Economic Inquiry* 56(1): 114–137, January 2018.**

Innovation, Mobility, and Growth

Bell, Alex, Raj Chetty, Xavier Jaravel, Neviana Petkova, and John Van Reenen. 2019. "Who Becomes an Inventor in America? The Importance of Exposure to Innovation." *Quarterly Journal of Economics* 134(2): 715–783. [Non-technical summary](#)

4. **Bian, Lin, Sarah-Jane Leslie, and Andrei Cimpian. 2017. "Gender Stereotypes about Intellectual Ability Emerge Early and Influence Children's Interests." *Science* 391 (6323): 389–91.**

Part II: Education

Higher Education

Chetty, Raj, John N. Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan. 2018. "Income Segregation and Intergenerational Mobility Across Colleges in the United States," *Quarterly Journal of Economics*, 2020. [Non-technical summary](#)

5. Dynarski, Susan, C.J. Libassi, Katherine Micheltore, and Stephanie Owen. 2018. "Closing the Gap: The Effect of a Targeted, Tuition-Free Promise on College Choices of High-Achieving, Low-Income Students." NBER Working Paper No. 25349

Ekowo, Manuela and Iris Palmer. 2016. [The Promise and Peril of Predictive Analytics in Higher Education](#). New America Education Policy Program Report.

Hoxby, Caroline, and Sarah Turner. 2013. "Expanding College Opportunities for High-Achieving, Low Income Students." *Stanford Institute for Economic Policy Research Discussion Paper*, no. 12-014: 1–57.

Zimmerman, Seth D. 2014. "The Returns to College Admission for Academically Marginal Students." *Journal of Labor Economics* 32(4): 711-754.

Primary Education

Chetty, Raj, John N. Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan. 2011. "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR." *Quarterly Journal of Economics* 126 (4): 1593–1660. [Non-technical summary](#)

Chetty, Raj, John N. Friedman, and Jonah E Rockoff. 2014. "Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates." *American Economic Review* 104 (9): 2593–2632. [Non-technical summary](#)

6, Chetty, Raj, John N. Friedman, and Jonah E. Rockoff. 2011. "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood." *American Economic Review* 104 (9): 2633–79. [Non-technical summary](#)

Fredriksson, Peter, Björn Öckert, and Hessel Oosterbeek. 2013. "Long-Term Effects of Class Size." *Quarterly Journal of Economics* 128 (1): 249–85.

Reardon, Sean. 2016. "School Segregation and Racial Academic Achievement Gaps." *Russell Sage Foundation Journal of the Social Sciences* 2 (5): 34–57.

Reardon, S. F., Ho, A. D., Shear, B. R., Fahle, E. M., Kalogrides, D., Jang, H., Chavez, B., Buontempo, J., & DiSalvo, R. (2019). Stanford Education Data Archive (Version 3.0). <https://edopportunity.org/>

Charter Schools

Abdulkadiroğlu, Atila, Joshua D. Angrist, Susan M. Dynarski, Thomas J. Kane, and Parag A. Pathak. 2011. "Accountability and Flexibility in Public Schools: Evidence from Boston's Charters and Pilots." *Quarterly Journal of Economics* 126 (2): 699–748.

Dobbie, Will, and Roland G. Fryer. 2011. "Are High-Quality Schools Enough to Increase Achievement among the Poor? Evidence from the Harlem Children's Zone." *American Economic Journal: Applied Economics* 3 (3): 158–87.

Part III: Racial Disparities

Racial Disparities and Segregation

Chetty, Raj, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. 2018. "Race and Economic Opportunity in the United States: An Intergenerational Perspective." Forthcoming, *Quarterly Journal of Economics* Non-technical summary

Fryer, Roland G., and Steven Levitt. 2004. "Understanding the Black-White Test Score Gap in the First Two Years of School." *Review of Economics and Statistics* 86 (2): 447-464.

Looney, Adam and Nicolas Turner. 2017. "Work and Opportunity Before and After Incarceration." Economic Studies at The Brookings Institute Technical Report.

Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology* 108(5): 937-975.

Discrimination and Bias

Banaji, Mahzarin and Anthony Greenwald. 2013. *Blindspot*, Delacorte Press.

Abrams, David, Marianne Bertrand, and Sendhil Mullainathan. 2012. "Do Judges Vary in Their Treatment of Race?" *Journal of Legal Studies* 41 (2): 347–83.

7. Bertrand, Marianne, and Sendhil Mullainathan. 2004. "Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination." *American Economic Review* 94 (4): 991–1013.

Eberhardt, Jennifer, Phillip Atiba Goff, Valerie J. Purdie, and Paul G. Davies. 2004. "Seeing Black: Race, Crime, and Visual Processing." *Journal of Personality and Social Psychology* 87(6): 876-893.

Edelman, Benjamin, Michael Luca, and Dan Svirsky. 2017. "Racial Discrimination in the Sharing Economy: Evidence from a Field Experiment." *American Economic Journal: Applied Economics* 9 (2): 1–22.

Glover, Dylan, Amanda Pallais, and William Pariente. 2017. "Discrimination as a Self-Fulfilling Prophecy: Evidence from French Grocery Stores." *Quarterly Journal of Economics* 132 (3): 1219-1260.



Stephens-Davidowitz, Seth. 2014. "The Cost of Racial Animus on a Black Candidate: Evidence using Google Search Data." *Journal of Public Economics* 118, 26-40.

Criminal Justice

Heller, Sara B., Anuj K. Shah, Jonathan Guryan, Jens Ludwig, Sendhil Mullainathan, Harold A. Pollack. 2020. "Thinking, Fast and Slow? Some Field Experiments to Reduce Crime and Dropout in Chicago," *Quarterly Journal of Economics*, forthcoming.

Hvistendahl, Mara. 2016. Can 'Predictive Policing' Prevent Crime Before It Happens? *Science News*.

8. Kleinberg, Jon, Himabindu Lakkaraju, Jure Leskovec, Jens Ludwig, and Sendhil Mullainathan. 2017. "Human Decisions and Machine Predictions." NBER Working Paper No. 23180.

James, Gareth, Daniela Witten, Trevor Hastie and Robert Tibshirani, "Tree-Based Methods," Chapter 8 in *An Introduction to Statistical Learning*.

Kleinberg, John, Jens Ludwig, and Sendhil Mullainathan. 2016. A Guide to Solving Social Problems with Machine Learning. *Harvard Business Review*.

Mohler, George, Martin Short, P. Jeffrey Brantingham, Frederick Schoenberg, and George Tita. 2011. "Self-Exciting Point Process Modeling of Crime." *Journal of the American Statistical Association* 106 (493): 100–108.

Spielkamp, Matthias. 2017. Inspecting Algorithms for Bias, MIT Tech Review.

Part IV: Health

Improving Health Outcomes

Allcott, Hunt, Rebecca Diamond, Jean-Pierre Dubé, Jessie Handbury, Ilya Rahkovsky, and Molly Schnell. 2019. "Food Deserts and the Causes of Nutritional Inequality," *Quarterly Journal of Economics* 134(4): 1793-1844.

Bruich, Gregory A. 2014. "The effect of SNAP benefits on household expenditures and consumption: New evidence from scanner data and the November 2013 benefit cuts." Harvard University working paper.

Chetty, Raj, Michael Stepner, Sarah Abraham, Shelby Lin, Benjamin Scuderi, Nicholas Turner, Augustin Bergeron, and David Cutler. 2016. "The Association Between Income and Life Expectancy in the United States, 2001-2014." *Journal of the American Medical Association* 315 (16): 1750–66. Non-technical summary, podcast discussion with Raj Chetty and Angus Deaton, and animated video.

Hastings, Justine and Jesse Shapiro. 2018. "How are SNAP benefits spent? Evidence from a retail panel." *American Economic Review* 108(12): 3493–3540.

Hastings, Justine, Ryan Kessler, and Jesse Shapiro. 2018. "The effect of SNAP on the composition of purchased foods: Evidence and implications." Brown University Working Paper.

9. Lazer, David, Ryan Kennedy, Gary King, and Alessandro Vespignani. 2014. "The Parable of Google Flu: Traps in Big Data Analysis." *Science* 343 (6167): 1203–5.

Obermeyer, Ziad and Thomas H. Lee. 2017. "Lost in thought--the limits of the human mind and the future of medicine," *New England Journal of Medicine* 377(13): 1209-1211.

Obermeyer, Ziad, Brian Powers, Christine Vogeli, and Sendhil Mullainathan. 2019. "Dissecting racial bias in an algorithm used to manage the health of populations," *Science* 366(6464): 447-453.

The Economics of Health Care and Insurance

Baicker, Katherine, Sarah L. Taubman, Heidi L. Allen, Mira Bernstein, Jonathan H. Gruber, Joseph P. Newhouse, Eric C. Schneider, Bill J. Wright, Alan M. Zaslavsky, and Amy N. Finkelstein. 2013. "The Oregon Experiment — Effects of Medicaid on Clinical Outcomes." *New England Journal of Medicine* 368: 1713–22. Non-technical summary.

Finkelstein, Amy N., Matthew Gentzkow, and Heidi Williams. 2016. "Sources of Geographic Variation in Health Care: Evidence from Patient Migration." *Quarterly Journal of Economics* 131 (4): 1681–1726.

10. Finkelstein, Amy, Nathaniel Hendren, and Mark Shepard. 2019. "Subsidizing Health Insurance for Low-Income Adults: Evidence from Massachusetts," *American Economic Review* 109(4): 1530-1567. Non-technical summary

Taubman, Sarah L, Heidi L Allen, Bill J Wright, Katherine Baicker, and Amy N Finkelstein. 2014. "Medicaid Increases Emergency-Department Use: Evidence from Oregon's Health Insurance Experiment." *Science* 343 (6168): 263–68. Non-technical summary

Wherry, Laura, Sarah Miller, Robert Kaestner, and Bruce Meyer. 2018. "Childhood Medicaid Coverage and Later Life Health Care Utilization." *Review of Economics and Statistics* 100(2): 287-302.

Part V: Climate Change

Effects of Air and Water Pollution

Carleton, Tamma, and Solomon Hsiang. 2016. "Social and Economic Impacts of Climate." *Science* 353 (6304): 1112.

Dell, Melissa, Benjamin Jones, and Benjamin Olken. 2012. "Temperature Shocks and Economic Growth: Evidence from the Last Half Century." *American Economic Journal: Macroeconomics* 4(3): 66-95.

Giglio, Stefano, Matteo Maggiori, and Johannes Stroebe. 2015. "Very Long-Run Discount Rates." *Quarterly Journal of Economics* 130 (1): 1–53.

Isen, Adam, Maya Rossin-Slater, and W. Reed Walker. 2017. "Every Breath You Take - Every Dollar You'll Make: The Long-Term Consequences of the Clean Air Act of 1970." *Journal of Political Economy* 125(3): 848-909. [Non-technical summary](#)

11. Moore, Frances C., Nick Obradovich, Flavio Lehner, Patrick Baylis. 2019. "Rapidly Declining Remarkability of Temperature Anomalies May Obscure Public Perception of Climate Change." *Proceedings of the National Academy of Sciences*, 116(11): 4905–4910.

Policies to Mitigate Climate Change

Allcott, Hunt, and Todd Rogers. 2014. "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation." *American Economic Review* 104(10): 3003–37.

Doyle, Joseph J., and Krislert Samphantharak. 2008. "\$2.00 Gas! Studying the Effects of a Gas Tax Moratorium." *Journal of Public Economics* 92 (3-4): 869–84.

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DeBacker, Jason, Bradley T. Heim, Shanthi P. Ramnath, and Justin M. Ross. 2019. "The Impact of State Taxes on Pass-through Businesses: Evidence from the 2012 Kansas Income Tax Reform." *Journal of Public Economics* 174: 53-75.

12. Diamond, Peter and Emmanuel Saez. 2011. "The Case for a Progressive Tax: From Basic Research to Policy Recommendations." *Journal of Economic Perspectives* 25(4): 165–190.

Savings and Wealth

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Course Policies

Attendance and Participation Expectations

Participation and attendance in class is essential for your understanding of the material. While attendance of course is not explicitly graded, participation via Canvas polls, in-class questions and answers, and other similar in-class activities will explicitly count towards your grade.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Religious accommodations

Our inclusive environment allows for religious expression. Students requesting accommodations based on faith, religious or a spiritual belief system in regard to examinations, other academic requirements or absences, are required to provide the instructor with written notice of specific dates for which the student requests alternative accommodations at the earliest possible date. For more information about religious accommodations at Ohio State, visit odi.osu.edu/religious-accommodations.

Late Assignments and Making Up Work

Please refer to CarmenCanvas for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-4357(HELP)** at any time if you have a technical problem.)

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **48 hours on days when class is in session at the university**. Please use your official Ohio State email address when emailing me. Please also list the course number and section in the subject line of the email (e.g., “ECON 1101: Trouble accessing video link” would be a great subject line if for some reason a link I posted on Canvas was not working). Without these last two items, I may not be able to immediately recognize your email as being associated with this class. This might result in an unanswered, or a delayed response. If for some reason, I do not reply to an email of yours, please send me a follow-up after 48 hours. It is completely ok to do this.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](http://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Grading:** For assignments submitted by the due date, I will try to provide grades within **ten days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.]

Copying

The materials used in connection with this course, including those created by the instructor or classmates, may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Acknowledgments

I am grateful to Raj Chetty and the Opportunity Insights team to share with us many of the resources for this course. I am also grateful to André Kurmann at Drexel University for sharing their version of the course. More information about Raj Chetty's original version of the course is available at: <https://opportunityinsights.org/course/>. Use of all material from this website has been cleared with Raj Chetty and André Kurmann.

University Academic Policies

Refer to <https://oaa.osu.edu/academic-policies> for academic policies, including student rights and responsibilities related to the following

- **Accessibility:** Arrange for accommodations if you anticipate barriers to your learning based on a disability
- **Academic integrity:** Understand your rights and responsibilities related to academic integrity and review the university's processes for addressing claims of academic misconduct
- **Safe learning environment:** Know the university's commitments to an environment free from discrimination or harassment, and find resources for reporting or finding support.

Mental Health and Well-Being

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling [614-292-5766](tel:614-292-5766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:614-292-5766) and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Disability Services Statement

Accommodation Policy

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make



arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:**
slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue

FERPA & Privacy in CarmenZoom

Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is used for educational use/purposes and may be made available to all students presently enrolled in the course. Please note that you are not allowed to share these recordings. This is to protect your FERPA rights and those of your fellow students.

Land Acknowledgement

We would like to acknowledge the land that The Ohio State University occupies is the ancestral and contemporary territory of the Shawnee, Potawatomi, Delaware, Miami, Peoria, Seneca, Wyandotte, Ojibwe and Cherokee peoples. Specifically, the university resides on land ceded in the 1795 Treaty of Greenville and the forced removal of tribes through the Indian Removal Act of 1830. As a land grant institution, we want to honor the resiliency of these tribal nations and recognize the historical contexts that has and continues to affect the Indigenous peoples of this land.

Weather or other short-term closing

Should in-person classes be canceled, I will notify you as to which alternative methods of teaching will be offered to ensure continuity of instruction for this class. Communication will be via CarmenCanvas.

Optional statements from great syllabi:

Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options on [Ohio State's Title IX website](http://titleix.osu.edu) (titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information, visit the [OIE website](http://equity.osu.edu) (equity.osu.edu) or email equity@osu.edu.

Workload/Course expectations (especially good for Skills classes)

For each credit, there should be about an hour of in class meeting time, and 2 hours out of class work. So for a one-credit class, you should expect 14 hours of in class instruction and about twice that outside of class preparing and doing homework and assignments. (Encourage your students to let you know if this gets out of proportion on a regular basis. They'll tell you!)

Grade Appeals

The assigned grade is designed to show the overall quality of work performed by each student. If you believe that any grade was not properly assigned you may write a letter explaining why you believe the grade was incorrectly assigned within one week of receiving the graded assignment back. Each appeal will be considered, and if a re-grade is performed, the entire assignment will be re-graded. The final grade may be greater, less, or equal to the original grade.

(Mostly used as a Capstone Class Resource) Statistical Consulting: Students wishing to have additional help with the statistical analysis for their papers may consult with the Statistical Consulting Service (www.scs.osu.edu/) and enroll in their Stat 5700 course.

Writing Consulting: Students wishing to have additional help with the writing of their papers can meet with a consultant at the Writing Center (<https://cstw.osu.edu/writing-center>).

Library Assistance: The Glenn College has a dedicated librarian at OSU Libraries, Kay Clopton (clopton.1@osu.edu), who can help provide research assistance. For more information and links to some common public affairs resources, see - <http://go.osu.edu/8gx>.

For Graduate Capstone Syllabi

Capstone papers from previous semesters can be found at

<https://buckeyemailosu.sharepoint.com/sites/GraduateCapstoneArchive/Shared%20Documents/Forms/AllItems.aspx>

Sensitive Content Warning Statement

(Note - Some students around the country are requesting that professors give a warning ahead of time if there is class material that could evoke a traumatic experience. Some schools, such as Oberlin College, have a proposed policy that would have required professors to give such warnings. Ohio State does not have a formal policy regarding trigger warnings, but the following language could be used by a faculty member who may want to provide such warnings, perhaps in the syllabus.)

"Some contents of this course may involve media that may be triggering to some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a Sexual Violence Support Coordinator at 614-292-1111, or Counseling and Consultation Services at 614-292-5766, and contacting the instructor if needed). Expectations are that we all will be respectful of our classmates while consuming this media and that we will create a safe space for each other. Failure to show respect to each other may result in dismissal from the class."

Military and Veterans Services Office:

Military-Connected Students

The Military and Veterans Services (MVS) Office offers a wide range of resources, for Military-Connected Students. Whether using benefits or not, all Military-Connected Students are encouraged to stop by the office to learn more about how MVS can be of support (ie. information about tutoring, transition services, access to the veteran's lounge, etc.). For active duty personnel, should you receive orders during the semester or know of classes that will be missed due to service commitments, please speak with me as soon as possible so that we can make any necessary arrangements. **MVS contact information:** milvets@osu.edu; 614-247-VETS; <http://veterans.osu.edu/>; 185 Student Academic Services Building, 281 W. Lane Avenue.

Statement about resources for food-insecure students:

The Ohio State University is committed to ensuring that all students have access to adequate and healthy food. **Any undergraduate or graduate student with a BuckID may confidentially use the Buckeye Food Alliance food pantries. No proof of need is required.** There are two locations:

- West Campus: Lincoln Tower. Doors are locked - call 614-688-2508 upon arrival.
- North Campus: St. Stephens. Look for the Buckeye Food Alliance (BFA) sign on the southwest corner of the building.

To learn more, visit <https://www.buckeyefoodalliance.org/>

YL

Ye, Lixin

To: Ando, Amy; MacEachern, Steven; Arora, Anish; Coleman, Mathew; McGraw, Scott; Williams, Kristi; Wegener, Duane; Makhija, Anil
Cc: Burnell, Sydneigh; Yang, Huanxing



Thu 8/17/2023 1:11 PM



ECON-1101-Syllabus.pdf
311 KB



concurrency_request_form_0.pdf
157 KB



2 attachments (468 KB) Save all to OneDrive - The Ohio State University Download all

Dear Colleagues,

I am writing to seek your concurrences for Econ 1101: Using Big Data to Solve Economic and Social Problems, a course newly proposed by our department. Attached please find the syllabus and the concurrence request form. I would very much appreciate it if your department/college could review the proposed course and return the concurrence form before August 31.

Thanks,
Lixin

Lixin Ye
Professor and Director of Undergraduate Studies
Department of Economics
The Ohio State University
449A Arps Hall, 1945 N. High Street, Columbus, OH 43210
614-292-6883 Office/ 614-292-3906 Fax

<https://www.asc.ohio-state.edu/ye.45/>

Concurrence Form

<p style="text-align: center;">The Ohio State University College of Arts and Sciences Concurrence Form</p>
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The purpose of this form is to provide a simple system of obtaining departmental reactions to course requests. **An e-mail may be substituted for this form.**

An academic unit initiating a request should complete Section A of this form and send a copy of the form, course request, and syllabus to each of the academic units that might have related interests in the course. Units should be allowed two weeks to respond to requests for concurrence.

Academic units receiving this form should respond to Section B and return the form to the initiating unit. Overlap of course content and other problems should be resolved by the academic units before this form and all other accompanying documentation may be forwarded to the College of Arts and Sciences and the Office of Academic Affairs.

A. Proposal to review

Initiating Academic Unit	Course Number	Course Title
Type of Proposal (New, Change, Withdrawal, or other)		Date request sent
Academic Unit Asked to Review		Date response needed

B. Response from the Academic Unit reviewing

Response: include a reaction to the proposal, including a statement of support or non-support (continued on the back of this form or a separate sheet, if necessary).

Signatures

1. Name	Position	Unit	Date
2. Name	Position	Unit	Date
3. Name	Position	Unit	Date



Ye, Lixin

To: Lee, Yoonkyung

Cc: Zhang, Yuan; Sivakoff, David; Kaizar, Elly; Yang, Huanxing; Burnell, Sydneigh; Hollingsworth, Alex

Wed 8/30/2023 8:09 AM

Dear Yoon,

Thanks so much for the support from your department as well as your detailed comments and suggestions, which should be very helpful for our instructor in offering this new course.

Thanks too for letting us know about your plan in developing a new course on causal inference. We are certainly interested and please do keep us posted.

Best,
Lixin

From: Lee, Yoonkyung <yklee@stat.osu.edu>
Sent: Tuesday, August 29, 2023 8:44 PM
To: Ye, Lixin <ye.45@osu.edu>
Cc: Zhang, Yuan <yzhanghf@stat.osu.edu>; Sivakoff, David <dsivakoff@stat.osu.edu>; Kaizar, Elly <kaizar.1@osu.edu>
Subject: Re: Concurrence request for Econ 1101: Using Big Data to Solve Economic and Social Problems

Dear Professor Ye,

The curriculum committee in the Department of Statistics reviewed the course proposal (Econ 1101). We find the proposed course focusing on social and economic issues interesting. Although it covers some statistical topics such as regression and causal inference, it does not replicate any of our current courses. So, we support the proposed course.