Big Data for Public Good

Spring 2023 – Directed Reading

"Data is to this century what oil was to the last one: a driver of growth and change. Flows of data have created new infrastructure, new businesses, new monopolies, new politics and – crucially – new economics." (The *Economist*, May 6, 2017)

Public and nonprofit agencies are beginning to unlock the potential of large-scale data to improve service delivery and inform policy. Computational tools capable of making productive use of big data have proliferated in recent years, drastically decreasing the barriers to entry for these applications. This course explores the practice of using big data to improve decision-making and evaluation, including techniques for data collection, analysis, and behavior change. You will learn about the opportunities and challenges of big data and devise a plan to apply them to areas of personal interest within the public sector.

Course Goal & Objectives

By the end of this course you should be able to:

1. Define big data and describe its characteristics;
2. Discuss how public agencies harness large-scale data to inform policy design, increase stakeholder engagement, and improve service delivery.
3. Recognize situations when it's possible to collect data to inform evidenced-based policy decision-making;
4. Intelligently consider the social, political, and ethical considerations of using big data and its analytical techniques for public uses.

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Class day/time: Live Webex sessions on Tuesdays 12:45-2:00pm; Click link on navbar in iCollege.

iCollege site:
https://gastate.view.usg.edu/d2l/home/2405983

Office Hrs: By appointment; please email me to set up a time to meet.

Performance & Evaluation

Weekly Discussion
(15 meetings, 2% each)

30%

Labs
(4 labs, 5% each)

20%

Data Certification

20%

Big Data Project Proposal
(PPT & Paper)

30%

Plus/Minus Grading Policy

This course uses a plus/minus grading scale. The points scale and grades are:

93 - 100	A	77 – 79.99	C+
90 – 92.99	A-	73 – 76.99	C
87 – 89.99	B+	70 – 72.99	C-
83 – 86.99	B	60 – 69.99	D
80 – 82.99	B -	Below 60	F

Helpful Notes

✓ **Think**

As a graduate class, I expect you to add value to the intellectual discussions of this subject. Although the course content may be new to you, as a developing scholar you have ideas and opinions worth sharing. You'll be expected to reflect on the values and dilemmas of big data throughout the course via online and in-person discussions, so make time to rigorously study and evaluate what you're learning and be prepared to share your thoughts.

✓ **Be Curious**

This cours serves multiple disciplines and has near limitless applications. I encourage you to go down rabbit holes of topics that interest you given the breadth of internet resources about big data. When you find something clever and cool, please share it with me and your peers. If you find a resource that you think is missing from this course, share that too. Your contributions benefit future students and me!

✓ **Time Management is Critical**

This course involves a lot of reading in a relatively short time frame, and many of these readings are essential for understanding how to proceed with each segment of the course. **No late submission will be accepted in this course**.

✓ **Know How to Ask for Help**

Although we meet in-person weekly for this course, it's still important to ask for help when necessary. Write me via email and phone when you have questions or need additional guidance on assignments. I'm also happy to talk about your career aspirations and how I can help connect you to alumni or other professionals for informational interviews.

Required Books

We will read selected chapters from these books, but you are NOT required to purchase them. I'll post copies to iCollege.

- Meier, P. (2015). [Digital Humanitarians: How Big Data Is Changing the Face of Humanitarian Response](#).
- O'Neil, C. (2016). [Weapons of math destruction: How big data increases inequality and threatens democracy](#).
- Pentland, A. (2015). [Social physics: How social networks can make us smarter](#).

Note: Additional, required readings will be available on iCollege.

Helpful Websites

- Data Science for Public Service - https://ds4ps.org/
- GSU Data Services - https://library.gsu.edu/services-and-spaces/research-services/data-services/
- Linked in Learning - https://technology.gsu.edu/technology-services/it-services/training-and-learning-resources/linkedin-learning/
- O'Reilly for Higher Education - https://research.library.gsu.edu/c.php?g=115640&p=7463735

Class Format

This is an in-person directed readings course. You're required to attend our weekly sessions on **Tuesdays from 4:30-5:30pm in my office**. We may occasionally meet via Webex if it makes sense to do so.

Please make sure that you understand how to navigate iCollege and the content for this course. All instructions for assignments and their due dates appear in iCollege in their respective submodules. You are responsible for knowing how to access and submit all assignments, reading, discussions, etc., so if you have questions about how to navigate the course please reach out to me in the first two weeks of class for a tutorial.

Course Schedule & Assignments

Unless indicated otherwise, all assignments are due by 11:59pm on the due dates listed in the course schedule. Deviations from this schedule may be necessary. See iCollege for changes.

Module & Section	What to Do	Due Dates
Course Introduction (1 week)		
Welcome & Orientation to the Course	• Read the Course Intro module • Read the Syllabus • Read Assignments & Policies - note expectations for course assignments • Read Engler, [What all policy analysts need to know about data science]().	1/10
Module 1 – Introduction to Big Data (3 weeks)		
1.2 The Value of Big Data	• Read Desouza & Smith, Big Data for Social Innovation • Read World Bank, Big Data in Action for Government • Read Meier, Ch 1, The Rise of Digital Humanitarians • Read Pentland, Ch 1, Social Physics	Discussion 1/17
1.3 Big Data and You	• Read Nantasenamat, The Data Science Process • Read Parker, Hilary: the most poisoned baby name • Watch Jee, How I would learn data science • Data Certification Plan	Data Cert Plan Due 1/27
1.4 The Challenges of Big Data	• Read O'Neil, On Being a Data Skeptic • Read Noble, Algorithms of Oppression • Read Krozyneva, Citizens versus the Internet	Discussion 1/31
Module 2 – Types of Big Data (2 weeks)		
2.2 Social Data	• Read Pentland, Ch 5, Observing People • Read Pentland, Ch 6, Collective Intelligence • Read Pentland, Appendix 1, Reality Mining • Read Meier, Ch 3, Crowd Computing Social Media • Lab 1 Models of Neighborhood Change	Discussion 2/7 Lab Due 2/10
2.3 Eyes in the Skies & Remote Sensing	• Read Meier, Ch 4 & 6 Arial Images & AI • Read Selinger & Leong, p.1-5 • Read FPF, Facial Recognition Poster • Lab 2 Measurement and Reliability	Discussion 2/14 Lab Due 2/17

Module & Section	What to Do	Due Dates
Module 3 – Discovery & Insights (3 weeks)		
3.2 Open Data & Discovery	• Read Young & Verhulst, Global Impact of Open Data • Read Pentland, Ch 2 • Read Bourke, A Gentle Guide to EDA	Discussion 2/21
3.3 Maching Learning & Prediction	• Read Brown, Machine Learning Explained • Optional, [Machine Learning for Humans](#) • Read Al-Garadi et al., Predicting Cyberbullying • Watch Grimson, Intro to Machine Learning • Lab 3 Feature Selection	Discussion 2/28 & 3/7 Lab Due 3/10
SPRING BREAK 3/13 – 3/17		
Module 4 – Bias in Big Data (3 weeks)		
4.2 Data Quality	• Read Meier, Ch 7 & 8 • Read Cai and Zhu, Challenges of Data Quality	Discussion 3/21
4.3 Bias in Manipulation & Modeling	• Read O'Neil, Weapons of Math Destruction • Read Zavrsnik, Algorithmic Justice • Lab 4 Feature Engineering	Discussion 3/28 & 4/4 Lab Due 3/31
Module 5 – Data Privacy & Stewardship (2 weeks)		
5.2 Data Privacy	• Pew, [Americans and Privacy](#) • Listen WNYC, Privacy Paradox • Listen Ted Radio Hour, Why does online privacy matter? • Read Brookings, Bridging the Gap	Discussion 4/11
5.3 Data Stewardship	• Read Reeves & McMillan, Secure Shouldn't Mean Secret • Read Wolford, What is GDPR? • Read Klosowski, The State of Consumer Data Privacy Laws in the US •	Discussion 4/18
Module 6 – Course Conclusion (2 weeks)		
6.2 Big Data Project & Presentations	• Big Data Project Proposal & Presentations	Discussion 4/25 Big Data Project Due 5/2
6.3 Data Certification	• Data Certification & Reflections	5/2

Support Statements

Inclusivity Statement

We understand that students in our programs come from a variety of backgrounds and perspectives. AYSPS is committed to providing a learning environment that respects diversity. To build this community we ask all members to:

- Share their unique experiences, values and beliefs
- Be open to the views of others
- Honor the uniqueness of their colleagues
- Appreciate the opportunity that we have to learn from each other in this community
- Value each other's opinions and communicate in a respectful manner
- Keep confidential discussions that the community has of a personal (or professional) nature

Students with Disabilities

Students who wish to request accommodation for a disability may do so by registering with the GSU Access & Accommodations Center (AACE). Students may only be accommodated upon issuance of a signed Accommodation Plan by AAACE. Students are responsible for providing a copy of that plan to instructors of all classes in which an accommodation is sought.

To register for accommodations please follow this link https://access.gsu.edu/how-to-connect/how-to-register/

For more information, contact AACE located at Student Center East. Suite 205, 55 Gilmer Street, Atlanta, GA 30303. Phone: 404-413-1560 Email: access@gsu.edu

Remote Academic Coaching

The Office of Disability Services also offers free remote academic coaching. To learn more about these services go to disability.gsu.edu/services or watch a Coaching Video.

Veterans & Serving Military

Georgia State honors its military and veteran men and women returning to pursue their education. Students who are veterans, serving in the military, and their dependents are encouraged to avail themselves of a full range of college services and activities through the Military Outreach Center (MOC).

For assistance or guidance while attending GSU on campus or online, contact the Atlanta Campus Military Student Advocate, Randy Barrone at 404-413-2331. Also, please be sure and let me know ASAP if or when there is any possibility of you being activated and deployed. Thank You For Your Service!

For more information contact the GSU Military Outreach Center
Phone: (404) 413-2331, Email: rbarrone@gsu.edu, Website: military.gsu.edu
Address: Dahlberg Hall, 30 Courtland Street, Suite 217, Atlanta, GA 30303

Personal and Mental Health

Maintaining your physical and mental health is an important element of success in graduate school. Staying healthy requires minimizing risky behaviors and stressors that can result in illness and an inability to attend class or complete coursework. The best way to stay healthy while COVID-19 still poses risks to our community is to get vaccinated and wear a mask in class and elsewhere when you can't socially distance. Students may be requested to wear masks during meetings if you or I have been exposed.

If you are exposed to COVID-19 during the semester, you should get tested immediately. If you test positive for COVID-19 after exposure, you should submit documentation to the Dean of Students Office to be excused from class while quarantined.

Stay up to date on the best way to protect yourself from COVID-19 by frequently visiting the Centers for Disease Control and Prevention's website. Changes to campus operations resulting from new CDC guidance will be announced via email and other university media should they be necessary.

In any time (not just a pandemic), graduate school can be a stressful time of life. GSU has wellness resources that you should take advantage of while they're "free." Find out more about the Counseling Center's programing here: https://counselingcenter.gsu.edu/.

Online Course Evaluations – Student Surveys

Your constructive assessment of this course plays an indispensable role in shaping improvements of all courses within this program and your educational experiences at Georgia State. Please take time to fill out the online course evaluations. We appreciate honest and open feedback.