

SURV612: Ethical Considerations for Data Science Research

Section Syllabus, Autumn 2026

Professor Information

Professor: Dr. Jacob J. Coutts (he/his/him)

Email: jjcoutts@umd.edu

Location: BPS 3145 or [Zoom](#)

Student hours: Mon 5:00-6:00 PM or by appt.

Course Information

Mode: Online

Time: Mon 11:00AM-Noon

Classroom: [Zoom](#)

Course website: <https://elms.umd.edu>

Lecture Videos Recorded by Dr. Jessica Vitak

Course Description

Welcome to SURV612! My name is Dr. Jacob Coutts (call me Dr. J or Jacob). The goal of research ethics is to protect human subjects from harm when they participate in a study. In the digital age, however, what constitutes "participation" has become blurry, especially with the rise of social media platforms and other online apps and services. Furthermore, new applications of big data raise important questions about how to protect consumers from harms, and what kinds of notice and consent should be obtained. This course provides an introduction and overview of research ethics in the 21st century and evaluates the many challenges to conducting ethical research.

Learning Outcomes

After successfully completing this course, you will be able to:

Describe the history of research ethics and the goals of institutional review boards.	Identify ethical issues in the study design, data collection, and data analysis process.
Describe the challenges data science and big data raise for protecting individuals' rights and privacy.	Detail best practices for conducting ethical research.

Course Structure

This course is entirely **online** with a **flipped design**. Lectures and other materials are **asynchronous**. Each Monday from 11:00AM-Noon, I will host a **required synchronous** session where we discuss the material for the week. In preparation for the weekly online meetings, students are expected to watch the lecture videos and read the assigned literature before the start of the meeting. In addition, students should post questions and discussion comments about the materials covered in the videos and readings of the week in the forum at least one day before our meetings. This is a four-week class and things will move quickly.



- You will need access to a computer for this class. This is an online class and all of our work will be complete virtually.
- If computer access is going to be an issue for you, reach out to me immediately and I can get you connected to resources on campus.

Tips for Success in this Course

1. **Attend Student Hours.** You may have heard about "office hours," but I feel like this term does not adequately convey what this time is for. It is for YOU. During this time, we're available for you to ask questions about class, graduate school, careers in data science or statistics, internships, professional development, or whatever other questions you may have. Meetings can be held either in-person or via Zoom—whichever you are more comfortable with.
2. **Participate.** Although the class has an online format, you should interact with the content early and often. It will help me know you better and make sure you're keeping up with the material.
3. **Do not fall behind.** All the material builds on itself over the course of the semester. This means that keeping up with all material is crucial to succeeding in this class. **If you are feeling lost or having trouble maintaining pace, please let me know early on so I can work to get you up to speed.**
4. **Use ELMS (Canvas) notification settings.** Pro tip! ELMS can ensure you receive timely notifications of course updates via email or text. I recommend you enable announcements be sent instantly (or at least daily). I will send out weekly announcements detailing what is to come, as well as intermittent announcements throughout the week.
5. **Email.** The best way to reach me for university-approved absences and other questions is via email (jjcoutts@umd.edu). I typically respond to emails during the week within 24 hours. If you email outside of business hours (9:00 AM-5:30 PM), I may not see the email until the next day. Please put "SURV612" in the subject of all course-related emails to ensure I see them. Check the syllabus and Canvas for due dates and assignment information before emailing.
6. **Be respectful.** To me and especially to your peers. I promise to do the same.

Course Breakdown

Participation (15% of grade)

- Throughout the semester, there will be numerous opportunities to participate. You will receive a participation grade for each synchronous session and each discussion board for the weekly materials. That is, you will be scored on synchronous and asynchronous participation.

Assignments (45% of grade)

- There are three online homework assignments that cover important applications of the material. These will be released with at least one week to complete them. Each assignment is worth 15% of your grade.

Quizzes (20% of grade)

- There are a total of four open-book quizzes that assess your comprehension of the class material. Your first quiz will have two attempts and I will take your highest score (to get you accustomed to the format). All subsequent quizzes will have only one attempt. Each quiz is 5% of your grade.

Final Paper (20% of grade)

- Your final assignment in this class is a paper that ties together concepts covered throughout the entire semester. Additional information about the final paper will be provided at the halfway point of the term.

Grading

Grades will be assigned based on the total percent earned using the following rubric. **Grades will not be rounded...regardless of how close to the boundary you are. I do not offer extra credit assignments.**

If you think there is an error with a particular grade, please come talk to me during student hours, after class, or schedule an appointment and I can discuss the grade and correct it if need be. You must do this within one week of the grade being submitted.

A+	97.0-100%	B+	87.0-89.9%	C+	77.0-79.9%	D+	67.0-69.9%	F	<60.0%
A	93.0-96.9%	B	83.0-86.9%	C	73.0-76.9%	D	63.0-66.9%		
A-	90.0-92.9%	B-	80.0-82.9%	C-	70.0-72.9%	D-	60.0-62.9%		

Course Policies

Late Work

Timely submission of coursework is essential. The due date of each assignment will be stated clearly in the assignment description. Late homework assignments will be subject to a 10% penalty and can only be submitted up to 24 hours after the due date. **Reach out to me before the due date if you need an extension on an assignment, though note that because of the flexible deadlines in this graduate-level class, extensions will rarely be granted.** Absolutely no work can be turned in after the final day of the term. (Yes, even one minute after.)

Campus Policies

Please visit <http://www.ugst.umd.edu/courserelatedpolicies.html> for the Office of Undergraduate Studies' full list of course-related policies and follow up with me if you have questions. It is our shared responsibility to abide by the University of Maryland's policies.

Statement on Artificial Intelligence (AI)

AI platforms are ultimately tools. In the hands of experts, they can improve workflow, generate ideas, and facilitate learning. However, like all tools, they can ruin things in the wrong hands. You are not an expert. You are here to learn and grow your knowledge base in an important topic. Consequently, the appropriate use case of AI is narrow. You can use it to help debug your code (i.e., help identify errors), generate practice questions, and ask for additional explanations on topics. You may not, under any circumstances, use AI to generate answers to problems, replace your own ideas, write code, or contribute to graded assignments in any other way. If you're struggling, attend student hours. If you're busy, utilize drops. If you're overworked, reach out to me. Do not waste the instructional team's time having us read content generated by an LLM. It will be treated as a violation of the student code of conduct. I don't want to see an algorithm's prediction based on other's ideas; I want to see yours. If you want to go anywhere in the world of data science and research, you must know this content well, and you simply won't if you rely on AI.

Academic Dishonesty

- Cheating in any form (e.g., copying, falsifying signatures, plagiarism) will not be tolerated. It will result in a referral to the Office of Student Conduct regardless of scope and circumstances, as required by university rules and regulations. There are severe consequences of academic misconduct, some of which are permanent and could appear on your transcript. If you have any questions regarding the University's policies on scholastic dishonesty, please see <https://policies.umd.edu/academic-affairs/university-of-maryland-code-of-academic-integrity>. It is very important that you complete your own assignments, and do not share files (excluding raw data), partial work, or final work. For more about the Student Honor Council or Code of Academic Integrity, please visit <https://studentconduct.umd.edu/>.
- Neither course assistance websites, such as CourseHero, nor AI generated content are permitted. Material taken or copied from these sites will be deemed a violation of the university's academic integrity policy. Relying on restricted sources will hamper your learning process, particularly the critical thinking steps necessary for college-level assignments. As future professionals, your commitment to high ethical standards and honesty begins with your time here at the University of Maryland.

Accommodations

Please come and see me as soon as possible if you think you might need any special accommodations for disabilities. In addition, please contact the Disability Support Services (301) 314-7682 or by web at <https://www.counseling.umd.edu/ADS/>. Disability Support Services will work with me to help create appropriate academic accommodations for any qualified students with disabilities. If you experience psychological distress during the course of the semester you can get professional help at the Counseling Center (301-314-7651 or <https://www.counseling.umd.edu/>).

Names/Pronouns and Self-Identification

- The University of Maryland recognizes the importance of a diverse student body and I am committed to fostering equitable classroom environments. We invite you, if you wish, to tell me how you want to be referred to both in terms of your preferred name and your pronouns (e.g., he/him, she/her, they/them). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit <https://lgbtq.umd.edu/trans-resources-policies> to learn more.
- Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. We will do our best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Reporting Racism and Other Forms of Hate and Bias

- If you experience racism or other form of bias or hate in this class, please report the incident to the Office of Diversity and Inclusion at <https://www.diversity.umd.edu/hbrp/>.

Reporting Sexual Misconduct

ALL instructors and teaching assistants are required to report any PAST OR PRESENT instances of sexual misconduct to the Title IX office. All incidents faced by members of the campus community or visitors must

be reported, regardless of where the incident occurred (i.e., on or off campus), when the incident occurred (i.e., recently or many years past), how the instructor or teaching assistant learned of the incident (i.e., directly from the individual who experienced it or from their friend/colleague), and regardless of whether the incident was previously reported.

What I'm conveying in the above sections is that I am your **ally**, and there are many amazing resources at the University of Maryland that will help you feel comfortable and safe in this learning environment. Regardless of what you're struggling with, there is a resource for you.

Long Class Description

Networked technologies—including the internet of things (IoT), wearables, ubiquitous sensing, social sharing platforms, and other AI-driven systems—are generating a tremendous amount of data about individuals, companies, and societies. These technologies provide a range of new opportunities for data scientists and researchers to understand human behavior and develop new tools that benefit society. At the same time, the ease with which data can be collected and analyzed raises a wide range of ethical questions about these technologies, their creators, and their users.

In recent years, we have seen numerous examples of research and technologies that are ethically problematic. For example, Facebook's Cambridge Analytica scandal revealed researchers using problematic tactics to collect profile data from millions of Facebook users. In addition, algorithms and machine learning techniques have been revealed as systematically biased in how they evaluate resumes¹, recommend parole for prisoners², decide where police units should deploy³, and identify people through facial recognition technology³, just to name a few.

Therefore, it is critical that data scientists and others who will be working with big data can critically assess the potential risks and benefits of any end products, whether they are developing a search engine or a tool for detecting terrorists. This course will provide an overview of key ethical issues that arise when working with big data, and it will provide opportunities to review and reflect on past mistakes in this space.

We will address this goal in the course schedule below.

Tentative Course Schedule

All readings, assignments, and due dates are subject to change. Refer to Canvas for the most current version of activities and due dates. ***All course assignments due by 11:59 PM of scheduled day unless otherwise noted.***

Unit 1

Video Lectures Available: 24 August 2026

Online Meeting: 31 August 2026

Online Quiz and Discussion Due: Discussion Board (31 August) and Quiz (6 September)

Required Readings (see ELMS):

- Boyd, D. & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. *Information, Communication & Society*, 15(5), 662-679.
- Metcalf, J., & Crawford, K. (2016). Where are human subjects in big data research? The emerging ethics divide. *Big Data & Society*, 3(1).
- Moon, M. (2009). The history and role of Institutional Review Boards: A useful tension. *AMA Journal of Ethics*, 11(4), 311-316. <https://doi.org/10.1001/virtualmentor.2009.11.4.pfor1-0904>

Recommended Readings (Optional, see ELMS):

- Friedman, B., & Nissenbaum, H. (1996). Bias in computer systems. *ACM Transactions on Information Systems*, 14(3), 330-347.
- Postman, N. (1998, March 28). Five things we need to know about technological change. *Talk delivered in Denver, Colorado*.

By the end of this unit students will...

- Describe emerging ethical questions in the era of big data
- Identify key benefits and drawbacks of big data.
- Critique research that collects and analyzes "public" data.

Unit 2

Video Lectures Available: 4 September 2026

Online Meeting: 14 September 2026

Online Quiz and Discussion Due: 13 September 2026

Assignment 1 Due: 11 September 2026

Required Readings (see ELMS):

- Metcalf, J. (2014). "Ethics codes: History, context, and challenges." *Council for Big Data, Ethics, and Society*.
- Saltz, J. S., & Dewar, N. (2019). Data science ethical considerations: a systematic literature review and proposed project framework.
- Velasquez, M., Andre, C., Shanks, S.J., T., & Meyer, M.J. "What is ethics?" Center for Applied Ethics, Santa Clara University.

Recommended Readings (Optional, see ELMS):

- Association of Internet Researchers (AoIR) Code of Ethics.
- Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW)* (pp. 941-953). New York: ACM.
- Vitak, J., Shilton, K., & Ashktorab, Z. (2016). Beyond the Belmont Principles: Ethical challenges, practices, and beliefs in the online data research community.

By the end of this unit students will...

- Describe key ethical questions for research using big data.

- Identify and describe concepts important to codes of ethics.
- Critique existing codes of ethics regarding their treatment of big data.
- Identify ethical problems with a study design using big data.

Unit 3

Video Lectures Available: 11 September 2026

Online Meeting: 21 September 2026

Online Quiz and Discussion Due: 20 September 2026

Assignment 2 Due: 17 September 2026

Required Readings (see ELMS):

Angwin, J., Larson, J., Mattu, S., & Kirchner, L. (2016). Machine bias. *ProPublica*.

Barocas, S., & Nissenbaum, H. (2014, November). Big data's end run around procedural privacy protections: Recognizing the inherent limitations of consent and anonymity. *Communications of the ACM*, 57(11), 31-33.

Zimmer, M. (2010). "But the data is already public": On the ethics of research in Facebook. *Ethics and Information Technology*, 12(4), 313–325.

Recommended Readings (Optional, see ELMS):

Ohm, P. (2009). Broken promises of privacy: Responding to the surprising failure of anonymization. *UCLA Law Review*, 57, 1701.

Vetro, A., Santangelo, A., Beretta, E. and De Martin, J.C. (2019). AI: from rational agents to socially responsible agents. *Digital Policy, Regulation and Governance*, 21, 291-304.

Zimmer, M. (2016, May 14). OkCupid Study Reveals the Perils of Big-Data Science. *Wired*.

By the end of this unit students will...

- Identify new concerns that have arisen for research involving digital data/big data.
- Design a study design addresses ethical concerns around consent, anonymization, and public data.
- Describe the pros and cons of aggregating multiple data sources.
- Describe best practices for storing and analyzing data.

Unit 4

Video Lectures Available: 18 September 2026

Online Meeting: 28 September 2026

Online Quiz and Discussion Due: 27 September 2026

Assignment 3 Due: 25 September 2026

Required Readings (see ELMS):

Barocas, S., & Boyd, D. (2017). Engaging the ethics of data science in practice. *Communications of the ACM*, 60(11), 23-25.

Olteanu, A., Castillo, C., Diaz, F., & Kiciman, E. (2016). Social data: Biases, methodological pitfalls, and ethical boundaries. *Frontiers in Big Data*, 2, Article 13.

Sloane, M. (2022). Here's what's missing in the quest to make AI fair. *Nature*, 605, 9.

Tiell, S. & Metcalf, J. (2016). The Ethics of Data Sharing: A guide to best practices and governance. *Accenture*.

Recommended Readings (Optional, see ELMS):

Kearns, M., & Roth, A. (2020). Ethical algorithm design should guide technology regulation. *Brookings Institution*.

Keyes, O. (2019, April 8). Counting the Countless: Why data science is a profound threat for queer people. *Real Life*.

Makhoul, J., Chehab, R. F., Shaito, Z., & Sibai, A. M. (2018). A scoping review of reporting 'Ethical Research Practices' in research conducted among refugees and war-affected populations in the Arab world. *BMC Medical Ethics*, 19(1), 36.

By the end of this unit students will...

- Create and implement an ethical research checklist to apply to new studies.
- Critically evaluate research studies regarding their potential for social harm.
- Articulate ethical challenges to conducting research with marginalized groups.

Final Paper: Due 28 September by 11:59 PM.

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