



# Privacy, Security, and Ethics for Big Data

**INST-366-0103**  
**SPRING 2023**

## Course Description

The increasing number of networked information technologies—including 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 offer enormous benefits but also create enormous risks to individual privacy and national security. Further, the ease with which data can be collected from online sources, analyzed, and inferences drawn about individual users raises a wide range of ethical questions about these technologies, their creators, and their users.

In this course, students will evaluate major privacy and security questions raised by big data and related technologies. Students will learn about the history of research ethics and consider how ethical frameworks can and should be applied to digital data. They will work through case studies from real world scenarios to understand the complex interactions between data security, privacy, and ethics in modern businesses. This course is required for the InfoSci Cybersecurity and Privacy Specialization.

## Learning Outcomes

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

- Identify and explain basic ethical and policy-based frameworks for working with big data and apply these frameworks to real-world cases.
- Explain differences between and shared values across data, ethics, and society.
- Identify situations where data is sensitive, assess the risks, and describe how various stakeholders could respond to those risks.
- Describe how to minimize privacy/security compromises through the data lifecycle (from collection through dissemination).
- Implement good security and privacy practices in personal data storage, use, and reporting.

## Required Resources

Course website: [elms.umd.edu](https://elms.umd.edu)

I use Canvas for all course readings, slide decks, study guides (when relevant), and communication. View the current week's Module for upcoming readings and assignments. I also post class-wide announcements through Canvas using Announcements. Make sure you have Canvas set up to forward Announcements to your email and/or regularly check your account to ensure you don't miss any class-related information.

## Dr. Jessica Vitak

Pronounced VEE-tack

she/her/hers

[jvitak@umd.edu](mailto:jvitak@umd.edu)

## TA/Grader

Jessica Perkins

she/her/hers

[jperkin2@umd.edu](mailto:jperkin2@umd.edu)

## Class Meetings

This is a flipped class. Lectures will be posted on Canvas each week. We will meet once a week (**Tuesdays, 2-3:15pm in PHY-1204**) for discussion and activities.

## Office Hours

Thursdays 2-3pm (HBK2117G)

or by appointment:

<https://calend.ly/jvitak>

## Prerequisites

INST201 or permission of instructor

## Course Communication

Time-sensitive announcements will be posted on ELMS.

- Contact me via Canvas or by email (be sure to include "INST366" in the subject).
- Contact TA with grade-related questions.
- Email correspondence should be like face-to-face correspondence. Include a salutation (Dear Dr./Prof Vitak) and end with your name.

I will generally reply to emails within **two business days**. If you have not heard from me after that time, please send me a follow-up email.

## Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit [www.ugst.umd.edu/courserelatedpolicies.html](http://www.ugst.umd.edu/courserelatedpolicies.html) for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

## Class Structure

This is a “flipped class.” **Weekly content will become available on Canvas each Friday at 9am ET.** This includes readings, assignments, and pre-recorded lectures. **All assignments are due two Mondays later at 11:59pm ET**, giving students ~10 days to complete that week's materials.

Because lectures are pre-recorded, you can watch them at any point during the week. However, we'll meet in person once a week during our regularly scheduled time (**Tuesdays at 2pm**) to talk about the prior week's content, current events related to class, and engage in activities and discussions. Some of these activities will count toward your grade, so you should plan to attend Tuesday sessions in person. There will not be a live stream of the class over Zoom and, under normal circumstances, no way to make up these class activities. Note that I structured this assignment so that even if you need to miss a couple classes due to illness or travel, you can still get full credit (see assignment details below).

That said, I acknowledge that being a college student can be quite stressful, and many of you are balancing work and school and/or living at home. If you are experiencing problems keeping up with class material, please reach out to me as soon as possible so we can work on a plan to help you make it through the semester. I am also offering each of you **two “late passes”** for the semester: for any assignment (except the final), you may submit an assignment up to **three days late without penalty**. To use this, you must add a note when you submit on Canvas saying you are using the late pass. Without a note, your assignment will be graded as late. Note: late passes cannot be applied retroactively to past assignments.

## Activities, Learning Assessments, & Expectations for Students

### Course Activities

Detailed descriptions of assignments and grading rubrics are included in the assignment page on Canvas. Make sure to review that before submitting them! Your final grade will be based on the following components:

Learning Assessments	#	Points Each	Category Total
Exit tickets	12	1	12
In-Class Activities	6	2	12
Ethics Training	1	5	5
Case Study Evaluations	4	8	32
Managing Your Data	1	8	8
Ethics of Data Mining Activity	1	8	8
Terms of Service/Privacy Policy Analysis	1	8	8
Final Exam	1	15	15
Total Points:			100

**Exit tickets (1% each, 12% total):** For each week's readings, you need to briefly summarize the two most important and/or interesting things you learned from the materials. You must also provide a question that came up based on the week's content. I will only count the top 12 scores for this assignment, meaning the two lowest scores are dropped.

**In-Class Activities (2% each, 12% total):** While attendance will not be taken in this course, students will regularly participate in class-based activities during our Tuesday sessions. I will only count the **top six scores** for this assignment; any activities we complete beyond those will be dropped from your final grade. If you have an excused absence (e.g., religious holiday; traveling with sports team), I will allow you to make up the activity outside of class, as long as it is submitted within one week of the activity date. Note that in order for you to make up missed activities, **you must notify me at least three hours prior to the start of class and request a makeup activity.** I do not need medical notes for illness-related absences unless it will affect a significant portion of the semester. In those cases, you should schedule a meeting to talk with me about ways to keep you up to date with course-related material.

**Case Studies (8% each; 32% total):** In this class, we'll be using case studies from real-world examples that highlight concepts from the class at the intersection of big data, ethics, and privacy/security. For each case study, you will be assigned a reading that overviews the case study, then you will complete an analysis of the case study based on guiding questions I provide. **I will provide six case study assignments throughout the semester and you will be asked to complete four** (or you may complete all six and the lowest two grade will be dropped).

**Managing Your Data Activity (8%):** One of the goals of this class is to make you more aware of and informed about how your data is used, and to empower you to take more control over your digital footprint. For this activity, you will explore your use of apps, websites, and other digital services, consider the various privacy tradeoffs you make to use them, and make decisions based on that information. The assignment will include a set of tasks to complete, including going through your mobile phone's location settings, reviewing social media sharing and public/private settings, and Googling your name). Complete the checklist (on Canvas), then write a reflection on the activity, what you discovered, and whether this activity changed your opinions about the data you share online.

**Ethics Training (5%):** When university researchers in the US want to conduct research with human subjects, they must first complete ethics training for social and behavioral research through CITI (Collaborative Institutional Training Initiative). You might have already completed this for another class. If so, great! If not, you need to do this first. The training involves reading and completing quizzes for several modules on data collection and management. You need a cumulative score of 80% across all quizzes to receive credit.

Regardless of whether you have completed the basic training, you also need to complete an elective module on big data (title: Human Subjects Considerations and Big Data Research; ID: 19126) and the internet-based research (ID: 510). To receive credit, you must upload the PDF certificate you receive for successfully completing training. Make sure you review the instructions on Canvas on how to save a certificate showing completion of all modules.

**Ethics of Data Mining (8%):** In Part 2 of the class, we consider some of the ethical considerations for large-scale data collection and analysis. To help you understand some of the concerns, you'll be using an existing tool (TAGS) to collect tweets related to a specific set of keywords or hashtags. You'll review the data and respond to a series of prompts listed on the assignment page.

**Reimagining Privacy Policies (8%):** Companies are required to provide consumers with details regarding the terms of service, which include end-user rights, as well as details on what the company can do with any data the

collect from consumers. The vast majority of people never engage with these overly-long, hard-to-understand documents. But perhaps we should, so we can make more informed decisions about our data. In this assignment, you will select a company you use, review its terms of use and privacy policy documents, critically assess the way they present this information, and provide a design evaluation of how to better communicate this important information.

**Final Exam (15%):** The goal of the final exam is to assess whether you have successfully met the learning outcomes of this class. The exam will require you to complete 3-4 essays on topics related to content covered in the course. The exam questions will be assigned on the final day of classes and you will have until the scheduled final exam date to submit your responses electronically. There will be no physical exam during the scheduled exam time.

**Final Grades:** Final letter grades are assigned based on the percentage of total assessment points earned. To be fair to everyone, I have to establish clear standards and apply them consistently, so please understand that being close to a cutoff is not the same this as making the cut (**89.99  $\neq$  90.00**). It would be unethical to make exceptions for some and not others.

Final Grade Cutoffs							
+	97.00%	+	87.00%	+	77.00%	+	67.00%
A	93.00%	B	83.00%	C	73.00%	D	63.00%
-	90.00%	-	80.00%	-	70.00%	-	60.00%
F <60.0%							

## Late Assignments

A late penalty will be applied to any assignment that is submitted late (starting one minute beyond the due date and time). Late assignments will be graded according to the following formula:

$$[\text{grade on assignment}] * 0.9^{[\text{number of days late}]}$$

For example, if you turn in an assignment one day late, and earned a 100% on that assignment, your final grade for that assignment would be  $(1.0)(0.9^1)$ , or 90%. If you turned in the same assignment three days late, and earned an 80%, your grade would be  $(0.80)(0.9^3)$ , or 58%. Therefore, although your grade will take a serious hit if the assignment is late, **in this class it is always better to turn in an assignment late than to not do it at all**. That said, I will not accept assignments submitted more than two weeks after the due date.

Please prepare in advance so you will not encounter technical difficulties that will result in your work receiving a late penalty. **Technical difficulties are not an excuse for late assignments — if you are having trouble submitting an assignment on Canvas, e-mail it to me before the deadline** to avoid a penalty. If you have a conflict with the due date, assignments can always be submitted early. Generally speaking, illnesses are not an excuse for late assignments because you will receive the assignments at least one week before they are due. Get some extra credit for reading the syllabus—if you are reading this, simply email me by February 8 a picture of a meme that directly relates to class material. Also remember that you also have two late passes to use at any time during the semester to get a three-day extension on an assignment.

## Course-Specific Policies

**Policy on Academic Misconduct.** Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. It is crucial to understand that the instructors do not have a choice of following other courses of actions in handling these cases. There are severe consequences of academic misconduct, some of which are permanent and reflected on the

student's transcript. For details about procedures governing such referrals and possible consequences for the student please visit <http://osc.umd.edu/OSC/Default.aspx>

It is very important that you complete your own assignments, and do not share any files or other work. The best course of action to take when you are having problems with an assignment question is to contact me. I am happy to work with students while they work on the assignments.

**University of Maryland Code of Academic Integrity.** The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://shc.umd.edu/SHC/Default.aspx>

**Note on Turnitin originality checker and plagiarism.** For this course, many of your assignments may be collected via Turnitin on our course Canvas page. I have chosen to use this tool because it can help you improve your scholarly writing and help me verify the integrity of student work. For information about Turnitin, how it works, and the feedback reports you may have access to, visit [Turnitin Originality Checker for Students](#).

Even for assignments that do not require you to submit through Turnitin, you are responsible for confirming that anything you submit does not contain plagiarism. This includes not including proper formatting to indicate when you directly quote or paraphrase another source. If you do not know how to correctly cite material, refer to the UMD Library resources, available at <https://lib.guides.umd.edu/c.php?g=327184&p=2588295>.

If you are found to have committed plagiarism, you will receive a zero on that assignment. You can resubmit the assignment within one week with a 50% penalty. If you violate Academic Integrity more than once, you will receive a zero in the class and will be referred to the [Student Honor Council](#).

**Note on AI-generated essays and “essay writing” services.** As we will discuss throughout the semester, technological advances generate both benefits and harms, and many uses of technology fall into ethically gray areas. There are multiple services online that students may use to generate their work. Use of these on assignments violates the university policy on academic integrity. These sites offer information that might be inaccurate or biased and most importantly, relying on restricted sources will hamper your learning process, particularly the critical thinking steps necessary for college-level assignments. If I discover a student has used AI or paid to have another party generate their work, the same policy as with plagiarism applies.

## Resources & Accommodations

### Accessibility and Disability Services

The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The Accessibility & Disability Service (ADS; <https://counseling.umd.edu/ads>) provides reasonable accommodations to qualified individuals to provide equal access to services, programs and activities. ADS **cannot assist retroactively**, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact me as soon as possible so that I have sufficient time to make arrangements.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at [adsfrontdesk@umd.edu](mailto:adsfrontdesk@umd.edu). Information about [sharing your accommodations with instructors, note taking assistance](#) and more is available from the [Counseling Center](#).

### Student Resources and Services

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit [UMD's Student Academic Support Services website](#) to learn more about the wide range of campus resources available to you.

In particular, everyone can use some help sharpening their communication skills (and improving their grade) by visiting [UMD's Writing Center](#) and schedule an appointment with the campus Writing Center.

You should also know there are a wide range of resources to support you with whatever you might need ([UMD's Student Resources and Services website](#) may help). If you feel it would be helpful to have someone to talk to, visit [UMD's Counseling Center](#) (<https://www.counseling.umd.edu>) or [one of the many other mental health resources on campus](#).

### Notice of Mandatory Reporting

As a faculty member, I am designated as a “Responsible University Employee,” and I must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to UMD’s Title IX Coordinator per University Policy on Sexual Harassment and Other Sexual Misconduct.

If you wish to speak with someone confidentially, please contact one of UMD’s confidential resources, such as [CARE to Stop Violence](#) (located on the Ground Floor of the Health Center) at 301-741-3442 or the [Counseling Center](#) (located at the Shoemaker Building) at 301-314-7651. You may also seek assistance or supportive measures from UMD’s Title IX Coordinator, Angela Nastase, by calling 301-405-1142, or emailing [titleIXcoordinator@umd.edu](mailto:titleIXcoordinator@umd.edu). To view further information on the above, please visit the [Office of Civil Rights and Sexual Misconduct's](#) website at [ocrsm.umd.edu](http://ocrsm.umd.edu).

### Basic Needs Security

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live, please visit [UMD's Division of Student Affairs website](#) for information about resources the campus offers you and let me know if I can help in any way.

### Veteran Resources

UMD provides some additional supports to our student veterans. You can access those resources at the office of [Veteran Student life](#) and the [Counseling Center](#). Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to the instructor.

### Names/Pronouns and Self Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). You can also do this in Canvas by going to Account>>Profile. The pronouns someone indicates are not necessarily indicative of their gender identity. Visit [trans.umd.edu](http://trans.umd.edu) 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. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

## Tips for Success in this Course

1. **Participate.** I invite you to engage deeply, ask questions, and talk about the course content with your classmates. You can learn a great deal from discussing ideas and perspectives with your peers and professor. Participation can also help you articulate your thoughts and develop critical thinking skills.
2. **Manage your time.** Students are often very busy, and I understand that you have obligations outside of this class. However, students do best when they plan adequate time that is devoted to course work. Block your schedule and set aside plenty of time to complete assignments including extra time to handle any technology related problems.
3. **Email me if you start to fall behind.** Each week builds on the previous content. If you feel you are starting to fall behind, message me as soon as possible so we can troubleshoot together. It will be hard to keep up with the course content if you fall behind in the pre-work or post-work.
4. **Use ELMS-Canvas notification settings.** Canvas can ensure you receive timely notifications in your email or via text. Be sure to enable announcements to be sent instantly or daily.
5. **Ask for help if needed.** If you need help with Canvas or other technology, IT Support. If you are struggling with a course concept, reach out to me and your classmates for support.

## Course Schedule

Unless otherwise statements, assignments are due Monday nights at 11:59pm.

Week/ Module	TOPIC (READINGS POSTED ON CANVAS)	WHAT'S DUE BY THE FOLLOWING WEEK?
<b>Part 1: Core Concepts</b>		
1 Week of Jan 22	<b>Situating “Big Data”: Data in the Digital Age</b>	<b>Read the syllabus!</b> <b>Complete class survey</b>
2 Week of Jan 29	<b>Ethical Frameworks for Evaluating (Big) Data</b>	<b>Case Study: Google &amp; AI Ethics</b>
3 Week of Feb 5	<b>Privacy and Big Data</b>	<b>Managing Your Data</b>
4 Week of Feb 12	<b>Security and Big Data</b>	<b>Case Study: Apple vs. DOJ/FBI</b>
5 Week of Feb 19	<b>Privacy, Security, Big Data, &amp; Legislation</b>	<b>Ethics Training</b>
<b>Part 2: Examining the Lifecycle of Data: From Collection to Dissemination</b>		
6 Week of Feb 26	<b>Issues from data collection/data mining</b>	<b>Data Mining Activity</b>

<b>Week/ Module</b>	<b>TOPIC (READINGS POSTED ON CANVAS)</b>	<b>WHAT'S DUE BY THE FOLLOWING WEEK?</b>
7 Week of March 5	<b>Issues with data exploration/analysis and dissemination</b>	<b>Ashley Madison Case Study</b>
8 Week of March 12	<b>Issues with algorithms &amp; automated systems</b>	<b>n/a</b>
<b>WEEK OF MARCH 19 – UMD SPRING BREAK – NO CLASS MEETING</b>		
<b>Part 3: Digging Into Developing Domains</b>		
9 Week of March 26	<b>Learning About You Through Your Social Network Data</b>	<b>Case Study: Cambridge Analytica</b>
10 Week of April 2	<b>Privacy as a Luxury Good</b>	<b>Case Study: Golden State Killer</b>
11 Week of April 9	<b>The Internet of Things, Smart Homes, and Smart Cities</b>	<b>n/a</b>
12 Week of April 16	<b>Surveillance at Home and Work</b>	<b>Privacy Policy Analysis</b>
13 Week of April 23	<b>Big Data, Better Health?</b>	<b>Case Study: Contact Tracing</b>
14 Week of April 30	<b>What's the future hold for digital privacy and security?</b>	<b>n/a</b>
Week of May 7	<b>Class wrap-up &amp; exam preview</b>	
<b>Final Exam (take home): Due May 17, 11:59pm</b>		

## Course Evaluation

Please submit a course evaluation through Student Feedback on Course Experiences in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to Course Experiences is confidential. Campus will notify you when Student Feedback on Course Experiences is open for you to complete your evaluations at the end of the semester. Please go directly to the [Student Feedback on Course Experiences](#) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing through Testudo the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.



## **Copyright Notice**

Course materials are copyrighted and may not be reproduced for anything other than personal use without written permission.