

## CS 6603 Syllabus

AI Ethics and Society, Section I, 3 Credits]

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### Instructor Information

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### General Course Information

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#### Description

Abuse of big data means your worst fears can come true. Are they being monitored by your employer? Check. Government intrusions into your daily life? Check. Being turned down by college admissions because you are predicted not to donate in 10-20 years? Check. Sounds a bit like the visions in the Minority Report. Alas, machine learning algorithms are already being deployed by industry, government, and even schools to make decisions that impact us in direct ways. These programs are typically promoted as fair and free of human biases, but humans who make mistakes are programming, calibrating, and evaluating their performance. Thus resides the problem. How do we design algorithms that effectively deal with large amounts of data to train them while ensuring their outcomes aren't misused? In this course, not only will we examine various AI/ML techniques that can be used to counterbalance the potential abuse and misuse of learning from big data, but we will focus on the effects of these technologies on individuals, organizations, and society, paying close attention to what our responsibilities are as computing professionals.

#### Course Learning Outcomes

There are several outcomes for the course, based on four primary modules:

##### *Module 1 - Data, Individuals, and Society*

Objective: After completing this module, students will be able to understand the power and impact that analytics and AI/ML have on individuals and society, especially concerning issues such as fairness and bias, ethics, legality, data collection, and public use.

##### *Module 2 – The BS of Big Data*

Objective: After completing this module, students will be able to understand the underlying components of big data, apply basic statistical techniques to data scenarios, and understand the

issues faced when learning from big data, ranging from data biases, overfitting, causation vs. correlation, etc.

### *Module 3 – Fairness in AI/ML*

Objective: After completing this module, students can understand and apply basic AI/ML techniques to data scenarios, focusing on identifying fairness and bias issues in designing decision-making systems. We will work systematically towards understanding technical approaches to current AI/ML applications, such as facial recognition, natural language processing, and predictive algorithms, all while being mindful of its social and legal context.

### *Module 4 – Bias Mitigation and Future Opportunities*

Objective: After completing this module, students can utilize tools and methods to quantify bias and examine ways to use algorithmic fairness to mitigate it, considering ethical and legal issues. Students will apply their knowledge of analytics and AI/ML to transform a current biased dataset into a more objective solution.

In this class, you will be challenged to broaden your understanding of state-of-the-art AI/ML algorithms and solutions, considering their potential impacts on society. You will have ample opportunity to analyze various situations critically and viewpoints provided in papers, books, on the web, and from your observations. You will be able to practice your learned knowledge by writing coherent and healthy-structured critiques of situations and papers, leading and participating in class discussions, and designing your algorithmic solutions. The issue of data misuse and abuse is not easily solvable; concrete right or wrong answers are not easily determined until solutions are typically deployed into society. Given this, you are entitled to your opinions on any topics presented throughout the course, whatever they happen to be. You will not be penalized for your viewpoints; however, you must be able to support your viewpoints and resulting solutions effectively. This means showing that you have given your approach to a problem some thought, can discuss its various trade-offs and implications and can support other viewpoints, even though your personal views may differ.

## **Required Course Materials**

### **Course Text**

*Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* by Cathy O’Neil (2016)

### **Additional Materials/Resources**

Additional assigned readings will be included with each assignment.

### **Classroom Management Tools (Located on Canvas)**

- Video Lectures
- Projects
- Graded Discussions

- Reading Materials
- Ed Discussion
- Grades
- Exams

**Grading Policy:**

**Assignment Distribution and Grading Scale**

Assignments	Weight
Homework Projects	40%
Written Critiques	10%
Mid-Term Exam	10%
Final Project	15%
Final Exam	10%
Class Discussion/Exercises/Quizzes ( <i>Case Studies, Exercises and Quizzes</i> )	15%
<b>Total</b>	<b>100%</b>

**Description of Graded Components**

**Assignments Quality**

This is a graduate-level course. You are expected to turn in graduate-level work. This means properly formatted reports, adequate responses in assignments and discussions (no one-liners), and actual substance to your work. We reserve the right to deduct points for work we do not feel is graduate-level.

**Submission Responsibility**

It is the student’s responsibility to ensure that all assignments (including discussions and exercises) are successfully uploaded and accessible in the course management system. **Students must verify that their submission has been properly completed.** As graduate students, you are expected to demonstrate responsibility and accountability in managing the submission process.

**Assignment Logistics**

*Homework Projects:* All reports for Homework Projects must be submitted in [Joyner Document Format \(JDF\)](#) formatting with a PDF file type. Unless specified differently in the instructions, the report must be a singular file that contains all relevant information to the assignment (code, charts/graphs, table). All other submissions will not be accepted (.ZIP, multiple .PNG submissions for graphs). Tables must be copied into the report. Screenshots of the tables are not accepted. Graphs shall be self-generated using Python, Excel, or other software tools. Hand-drawn graphs, tables, and charts are not allowed.

Per JDF formatting, the file name for reports is GTuserName\_{Assignment}, (ex. gBurdell3\_Assignment\_3.pdf). Deductions will be made if your file name is not submitted correctly.

*Case Studies:* Require at least two responses to your peers.

*Exercises:* Do not require responses to your peers.

## Course Policies

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### USG Required Course Policies [remove this heading in your final syllabus]

#### **Attendance and/or Participation**

This course is taught asynchronously, and all classroom discussions will occur in Ed forum posts. You will be expected to participate and ask any questions in public or private posts in Ed discussions. We have noticed that actively participating in Ed discussions drastically improves your assignment and exam performance, as assignment questions are asked and answered publicly there. You are not required to actively participate in discussions, but it is highly recommended to improve your performance in the class.

#### **Academic Integrity**

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review [Georgia Tech's Honor Code](#) and the student [Code of Conduct](#).

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

#### **Accommodations for Students with Disabilities**

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

## **Student-Faculty Expectations Agreement**

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

## **Pre- &/or Co-Requisites**

You will develop working knowledge of Python throughout this course, but basic programming proficiency is required. You should also have a basic understanding of how to use Jupyter notebooks.

The first assignment, Homework Project: Data Profile Assignment, requires an account on a platform that collects your data or the ability to access a friend's/relatives' data to complete the first assignment. This can be social media platforms (e.g., Instagram, Facebook), commerce sites (e.g., Amazon, eBay), streaming platforms (e.g., Spotify, Netflix), or other tech platforms (e.g., Google, Apple). You will not need this social media account for any other assignment.

## **Extra Credit Opportunities**

There are no opportunities for extra credit in this course, so it is important to plan ahead and stay consistent with your work. Focus on doing your best on each assignment.

## **AI Use Policy**

If your work is found to violate this policy, you **will be turned in for Academic Misconduct to the Office of Student Integrity.**

Recent advancements in artificial intelligence—Copilot, ChatGPT, etc.—can be great resources for improving your learning in the course, but it is important to ensure that their benefits are targeted at your learning rather than solely at your deliverables. Toward that end, the same academic integrity policy above applies to AI assistance: you are welcome to consult with AI agents just as you would consult with classmates, discuss ideas with friends, and seek feedback from colleagues. However, just as you would not hand your device to someone else to directly fix or improve your classwork, **you may not copy anything directly from an AI agent into your document, nor let an AI agent directly generate content for any part of a graded assignment deliverable. All submitted work must be your own.** This rule means you should disable any AI assistance more advanced than a grammar checker inside your word processors and IDEs.

Although you are prohibited from having these tools directly integrated into your workspace or from copying content from these assistants directly into your work, you are nonetheless permitted to use them more generally. The important consideration is to ensure that you are using the AI agent as a

learning assistant rather than as a homework assistant, so long as your submission solely reflects your own understanding of the content, you are encouraged to let AI assistants aid in developing your understanding.

### **Extensions, Late Assignments, & Re-Scheduled/Missed Exams**

If you are unable to hand in an assignment due to illness or a family issue, please open a private post in Ed to discuss it before the assignment's due date.

### **Regrade Policy**

If you feel your score is incorrect based on the feedback provided, you may request a rescore during the regrade time period, which is 7 full days from the date the grades are released. If the grades are released Monday, you will have till next Monday's End-Of-Day.

**To request a regrade**, you must:

1. **Open a private Ed Discussion post in the appropriate regrade category**
2. Copy all instructors and TAs
3. Provide your justification in the following format per question:
  - The step or question on assignment to be considered for regrade
  - Why do you consider there is an error in the score?

Requests that do not follow the above will not be considered (ex. questions in Canvas, regrade requests without adequate justifications)

Only one (1) regrade per assignment is allowed. Make sure your regrade request provides adequate details and encompasses all your questions. Additional requests for the same assignment will not be considered. Once a regrade has been completed by the TA, the grade is final.

### **Additional General Information on the Re-grading process:**

- Requesting a re-grade may result in a lower grade than what you were initially given by the TAs.
- It is essential to maintain a professional and formal tone in all communications. Requests that do not adhere to these standards of professionalism may not be considered.
- Once the instructors have reviewed the assignment and a final determination has been made regarding the grade, no further discussion about that assignment's grade will be considered.
- A re-grade is not the same as a request for accommodation due to hardship. If you have a legitimate hardship, please follow the **Late and Make up Work Policy** above. We will happily work with you to allow for additional time, etc., so that you can be successful in this course while working through your life challenges.

No regrades will be accepted for the midterm and final exam. For the midterm, only your score will be released (questions & answers are not released). For the final exam, regrades are not accepted due to time constraints.

### **Proctoring Information**

The midterm exam will be proctored as a closed book, closed notes, closed video, and no access to any external media except the exam itself. A proctored exam is similar to the one you would take in

the classroom. These exams are delivered via a tool called Honorlock. Honorlock is an online proctoring service that allows you to take your exam from the comfort of your home. You DO NOT need to create an account, download software, or schedule an appointment in advance. Honorlock is available 24/7; a computer, a working webcam, and a stable Internet connection are needed. You will need Google Chrome and download the Honorlock Chrome Extension to start. You can download the extension at [www.honorlock.com/extension/install](http://www.honorlock.com/extension/install).

When it is time to take the exam, log into CANVAS, go to the course, and click on the midterm exam link. Clicking Launch Proctoring will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a room scan. Honorlock will be recording your exam session via the webcam and your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device. If you encounter any issues, you may contact them by live chat, phone (844-243-2500), or email ([support@honorlock.com](mailto:support@honorlock.com)).

## Campus Resources for Students

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### Graduate Student Academic and Professional Success Resources:

A list of resources for graduate students is given on the [Office of Graduate and Postdoctoral Education](#) website. Specific information for [current graduate students](#) includes

- [Academic Resources](#) such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- [Student Resources](#) such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- [Professional Development](#) such as the programming from the Career Center and other professional development resources and events”

### Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A [comprehensive list](#) of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being ([student-resource-guide \(gatech.edu\)](http://student-resource-guide.gatech.edu))