CS 4001: Computing & Society

Time & Location	Tuesday classes will be on your own time Thursday classes will be together, 10:30am EDT on BlueJeans (link on Canvas)
Instructor	Daniel Schiff schiff@gatech.edu
Instructor Office Hours	Tuesdays 9:30am EDT (by appointment on BlueJeans), and Thursdays after class
Teaching Assistant	Beatriz Palacios bepa@gatech.edu
Teaching Assistant Office Hours	Mondays 10am EDT, Wednesdays 2pm EDT (by appointment on BlueJeans)

Overview & Learning Goals

Welcome to CS 4001. I am privileged to be teaching you this semester. As individuals who will go on to work in computing or other industries, you may have tremendous impact on society and on the world. Moreover, all of us face ethical issues regularly in our personal and professional lives. Ethics is therefore inescapable and complex, but also important and interesting. The goal of this course is to help stimulate your moral imagination, to show that ethics is necessarily integrated into your technical and professional work, and to help give you tools to detect and analyze ethical issues. You will learn about foundational issues in ethics and computing, and spend time thinking through an issue of your personal interest. My aim is for you to have a meaningful learning experience and come away with a new perspective on ethics.

You will learn about:

- Topics in classical ethics, such as ethical frameworks and philosophical argumentation.
- Professional ethics in the context of computing, including professional responsibilities, ethical codes, and the distinction between micro- and macroethics.
- Key issues facing computing today, such as privacy, algorithmic bias, sustainability, safety, and other topics *you* are interested in.
- Ethical issues related to a topic area *of your personal interest*.

By the end of the course, you should have expanded your:

- Ethical awareness. This means increased ethical sensitivity, the ability to observe and detect ethical issues in your professional and personal life.
- Ethical knowledge. You should know more about classical ethics, professional ethics in the context of computing, and important topics related to computing, such as privacy and bias.
- Ethical analysis. You should have new tools to explore ethical issues, for example, by breaking down complex issues into parts, or realizing that 'simple' issues are more complex. You should be able to apply ethical frameworks to help understand trade-offs and ultimately make informed decisions.
- Professional communication. You should be able to express ideas in a compelling way, supported by good evidence and reasoning, orally and in writing. You should also be able to engage in reasoned, constructive discourse with others with similar or different views.

You *may* experience changes (over time) to your:

- Ethical obligation. You may find changes to your sense of social responsibility.
- Ethical behavior. You may find that you identify new courses of action and wish to make new decisions as a result of increased awareness, knowledge, and analysis.

However, these last bits are not course requirements; they are up to you!

Course Materials

All course materials are in digital format or will be made available via Canvas. You should work your way through Canvas Modules each week.

Policies

Course Readings. Students sometimes feel they can skip assigned readings. In this course, readings and videos are not optional. However, the number of readings and videos is purposefully low so that they are not an undue burden. As a result, you are expected to complete all assigned work, as this is critical to you having a meaningful learning experience. All readings, videos, or out-of-class activities such as Piazza posts are listed in Models and are **due before class each Thursday**.

Remote Learning. Learning online can be difficult. We are all having to adjust to new circumstances quickly. We plan to be flexible and understanding of students, and I ask for you to treat instructors with similar flexibility and understanding. Reach out via Piazza if you are having any issues with internet

access, working environment, and so on. Also reach out if you have any feedback or what is working or not working for you.

Attendance. Our synchronous sessions will include small group discussions, activities, and a chance to reflect and develop ideas together, all of which are critical for you having the most meaningful learning experience. We will meet synchronously only 10 times this summer, once weekly, so attendance at every class should be a priority for you. One unexcused absence will not count against you. Additional unexcused absences will result in a 3-point reduction (one tenth of your class participation grade). If you need to miss class, please send me and the TA a message through Piazza prior to class.

Engagement. Engaging is more than showing up to class. You should come to class prepared to discuss and raise questions about the readings and share progress on your case study. You should contribute to learning in class through asking questions, helping facilitate small group discussions, and giving suggestions to your classmates. I encourage you to view class as an opportunity to explore ideas and challenge your thinking, not as a check-the-box exercise. My philosophy as an instructor is that the more you put into a course, the more you get out of it.

Asynchronous Option. For students for whom synchronous learning is not a possibility, there will be alternative options for earning Attendance & Engagement credit. The asynchronous option with alternative make-up assignments is intended for students who do not have reliable internet access or devices, or who have other major challenging circumstances.

Controversies. Some subjects may be controversial, but all topics should be discussed with evidence and respect. In many cases, there are no clear "right" answers. Instead, you should do your best to support your position with evidence (qualitative or quantitative). There should be no 'tech people know best' or 'philosophers know best' attitudes. Instead, try to give the benefit of the doubt to others' statements and positions, and attempt to find the grain of truth in them.

Professionalism. Course communications should be treated as professional. This is good practice for life after college. We will do our best to respond within 24-48 hours. You can refer to the Georgia Tech guidance on Student-Faculty Expectations for detail.

Formatting. Unless otherwise specified in the assignment, citations in written work must follow ACM or IEEE format. All written work (except perhaps bullets and tables/graphics) should be double-spaced in Times New Roman font, and have 12-point font with 1" margins all around. Citations should be in-line and in a References section at the end of your writing. Consider using a reference manager like EndNote, Zotero, or Mendeley to make management of references easier.

Writing and/or Language Usage. Communication is an essential skill and this course requires that you make an effort to produce effective communication of your ideas. Your goal should be to master finding and using resources for creating clear development of ideas and delivery of content to your audience. The Communication Center is a great resource.

The final project grading rubric shows two communication criteria: a) development, organization, and clarity of meaning and b) grammar and language usage. Students with concerns about their writing may request that writing not be graded on b) grammar and language usage. Even if you take advantage of the opt-out grading offer, we still expect you to try to write in clear academic English and will do our best to offer useful feedback on your writing. To take advantage of this option, you must mark "Opt-out of grammar and language usage" on the first page of your final assignment/paper.

Accommodations for Students with Disabilities. If you have registered through Georgia Tech's Office of Disability Services please contact the instructor to discuss accommodations and be prepared to request and e-mail a copy of your accommodation letter. We are here to support you. Note that closed captions are available on course videos.

Late Policy. Unless an exception for unusual circumstances has been agreed upon with your instructor at least 72 hours in advance, a late assignment will result in a 1/3 penalty to the letter grade (e.g., A- to B+) if the assignment is submitted that day, followed by an additional 1/3 letter grade penalty for each 24-hour delay.

Honor Code. This class abides by the Georgia Tech Honor Code. All assigned work is expected to be individual, except where explicitly written otherwise. You are encouraged to discuss the assignments with your classmates; however, what you hand in should be your own work.

Plagiarism. Citations should be used for ideas, statements, comments, etc. that are not common knowledge or your own original thought. Err on the side of avoiding any possible plagiarism. Refer to the guide from Georgia Tech and ask if you are unsure. In general, you should not be copying text directly, adopting major ideas, or borrowing more than a few words without using quotes and citing the original source. Instead, focus on paraphrasing and citing sources.

Support Services. We should all be here for one another during these challenging times. Georgia Tech has many options for both academic and personal support that are available HERE. For updated information on COVID-19, please see Georgia Tech's page HERE. Otherwise, please feel free to reach out to me during or outside of office hours.

Grading Breakdown

Readings and Weekly Case Studies *(highest 8 of 10 will be graded)*	30%
Class Attendance and Engagement *(1 unexcused absence allowed of 9 class sessions)*	30%
Midterm Exam	25%
Final Project	15%

My philosophy is that having a meaningful learning experience is more important than your final grade. To have a meaningful learning experience (which should result in excellent marks), student should plan to complete all assigned readings and be engaged in class.

Schedule of Readings and Assignments

Date	Topic	Out-of-Class Assignments	In-Class Activities
Start of Module 1: Classical Ethics			
Wk 1: 5/12 – 5/14	Welcome	Readings (due before class 5/14): • Intro to Ethics • The Drowning Child & video • The Drowning Child Experiment Case study #1 (due 5/16)	Course welcome Small group introductions
Wk 2: 5/19 – 5/21	Classical Ethics	Readings (due before class 5/21): • Consequentialism • Deontology • Virtue ethics • Ethics of care/feminist ethics • Justice/social contract theory Week 2 lecture videos (due before class 5/21) Case study #2 (due 5/23)	Small group case study discussions Philosophy Experiments
Wk 3: 5/26 – 5/28	Logic & Argumentation	Readings (due before class 5/28): • Formal logic (p. 1-12) • Logical fallacies • Using logic in writing Week 3 lecture videos (due before class 5/28) Case study #3 (due 5/30)	Evaluating Logical Arguments

Date	Topic	Out-of-Class Assignments	In-Class Activities
Start of Module 2: Professional Ethics			
Wk 4: 6/02 – 6/04	Ethics of Technology	Readings: • Do Artifacts have Politics? Plus one of the following: • Robot Ethics • Neurotechnology and Brain-Computer Interfaces • Energy, Engineering, and Ethics Week 4 lecture videos Case study #4 (due 6/06)	Content Regulation on Twitter
Wk 5: 6/08 – 6/10	Professional Responsibility	Readings: • Responsibility and Creativity in Engineering • Microethics and Macroethics Plus either: • NSPE Code of Ethics • ACM Code of Ethics Case study #5 (due 6/13)	The Co-Worker Career Choices
Wk 6: 6/16 – 6/18	Stakeholder Impact	Midterm exam (due 6/16) (no readings, no recorded lectures) Case study #6 (due 6/21)	Autonomous vehicles roleplay (Guest facilitator Dr. Ellen Zegura)

Date	Topic	Out-of-Class Assignments	In-Class Activities
Start of Module 3: Ethics in Computing			
Wk 7: 6/23 – 6/25	Privacy & Data	Readings: • Big Data Privacy: The Datafication of Personal Information • Privacy by Design • Public health surveillance, AI bias, and privacy in the fight against COVID-19 Activity: The Vulnerability Disclosure Debate Case study #7 (due 6/27) Final Project proposal (due 6/30)	Guest lecture on cybersecurity (Guest lecturer Karl Grindal)
Wk 8: 6/30 – 7/02	(Mis)information	Readings: • Deep Fakes: A Looming Challenge for Privacy, Democracy, and National Security (p. 1753-1786) • Beware online "filter bubbles" • Fighting Deepfakes when detection fails Activity: Piazza Reflection Week 8 lecture videos No case study (holiday)	No class together (holiday)
Wk 9: 7/07 – 7/09	Social Robotics	Readings: • Social and Assistive Robotics in Dementia Care	Guest lecture on social robotics (Dr. Jason Borenstein)

Date	Topic	Out-of-Class Assignments	In-Class Activities
		• The Griefbot That Could Change How We Mourn • The Ethics of Sex Robots Week 9 lecture videos Case study #8 (due 7/12)	
Wk 10: 7/14 – 7/16	Bias & Inequality	Readings: • Fairness in Machine Learning: Lessons from Political Philosophy • Bias and Fairness in ML (p.1-12) Activity: Week 10 lecture videos Case study #9 (due 7/18)	Guest lecture on AI & gender bias (Guest lecturer Dr. Sarah Myers West) Last day of class together
Wk 11: 7/21 – 7/23	Future of Work	Readings: • The Ambiguous Labor Market Impact of Automating Prediction • Automation: is it really different this time? Activity: Sentio Ergo Sum Week 11 lecture videos Case study #10 (due 7/25)	No class together Work on final project
…	…	…	…
7/28 (Tuesday)		Final project (due 7/28)	

Readings

Readings (and videos) should be completed each week prior to class on Thursday. In some technical courses, if you can set up or solve a problem, you may not need to read the textbook. In classes like CS 4001 (social science or ethics focus), the act of reading material from new disciplines is itself part of the learning. Readings are the most important part of the class. Do not skip the readings.

Case Study

Content. Along with the readings, your primary assignment for the semester will be an individual case study on a topic of your interest. Each week, due end of Saturday, you will prepare an approximately 1-2 page (double-spaced) written report to be submitted on Canvas. If it is not clear after careful consideration how your topic connects with the weekly assignment, you can modify/expand the scope of discussion. For example, if it is not clear to you how LiDAR systems relate to the ethics of privacy, you could discuss privacy in the context of autonomous vehicles.

The purpose is to 1) demonstrate your clear engagement with the readings and lectures, and to 2) connect the readings with your topic/case of interest with 3) reference to high-quality academic sources (journal and conference articles), fostering independent ethical thinking. This assignment is intended to meaningfully develop your understanding of the ethical and social implications of a topic you care about. So please have fun with it!

Formatting. Going a little under one page is OK if you have addressed the questions sufficiently (please do not pad titles and such), and you should not write more than two pages in any case.

You should be referring to at least a few high-quality academic citations beyond the required readings related to your topic and/or concepts in the readings. At least half of your references should be from these high-quality sources, typically academic journals or conferences. Other citations are also allowed/encouraged, such as think tank reports, company websites, or news articles. 4-5 citations is a reasonable amount, though fewer or more may be appropriate. The purpose of using high-quality academic sources is to build your own ideas based on the best of prior existing evidence, a skill you will need to be able to independently analyze new issues you face in the most rigorous way possible. You can find academic sources on databases like Google Scholar (not Google), the GT Library, and Web of Science. If you are not clear what an academic source is, see the link above.

References should be included in text ("in line citations") and at the end as a References or Works Cited section, and do not count towards page length. Follow the formatting requirements listed above under course Policies, including the use of IEEE or ACM style for references (not for the rest of formatting).

This is to help you practice formats typically used in engineering and computing, which may be especially helpful in reading or even writing for these venues in the future.

Your document should include a running header with basic information like your name, the short name of your case study topic, the course and semester, instructor name. Each week, there should be a smaller, non-running header that briefly indicates the week/date and name of the assignment. These subtle formatting points help ensure your writing is accessible, clear, and professional, as would be expected from your supervisors, clients, etc.

Each week, please prepend your most recent assignment (at the beginning) to your work from previous weeks when you submit on Canvas, such that you have a running document. This will help you and instructors see how your learning is developing!

Grading. Each assignment will be scored as a Check+, Check, Check- (roughly A, B, and C) or incomplete. A Check+ demonstrates careful engagement with the course readings and development of your independent thinking about your topic (good use of references can be a bonus here).

A Check indicates reasonable engagement with and understanding of course readings and appropriate application to your topic, but perhaps a lack of deep engagement, misunderstanding of some core concepts, or lack of adequate references.

A Check- indicates lack of adequate engagement/understanding of readings, or application to your topic (e.g., merely repeating what the readings say), or complete absence of high-quality academic sources.

Be careful not to engage in any plagiarism, intentionally or unintentionally.

We will automatically drop the two lowest assignments (of 10), so you have some room to work with. You can use these for weeks when you are busy, for assignments that don't interest you, or as a buffer for your grade.

Assignments are due Saturday by midnight (in your time zone). An assignment submitted late will be graded one level lower (e.g., Check+ → Check) if submitted within 24 hours of the deadline, two grades lower if under 48 hours late, and incomplete if more than 48 hours late.

Case Study Timeline

Due Date	Assignment	Description
5/16	Assignment #1: Case study topic proposal	Propose a case study topic • Describe the topic (try to make it accessible to a lay person) • Discuss some possible ethical issues related to your topic
5/23	Assignment #2: Classical Ethics	• Describe at least two normative ethical theories • How is or could each be applied to your topic?
5/30	Assignment #3: Logic & Argumentation	Find an online article, news story, etc., about your topic • Describe a logical argument it makes in a clear form • Evaluate the argument. Is it valid? Sound? Fallacious?
6/06	Assignment #4: Ethics of Tech.	• What are the "politics" of your topic? Describe the social context, issues, assumptions, etc., surrounding your topic
6/13	Assignment #5: Professional Responsibility	• Evaluate either the NSPE or ACM codes of ethics. Are they microethical? Macroethical? Are they adequate? • Discuss micro and macroethical dimensions of your topic
6/20	Assignment #6: Stakeholder Impact	• Identify who is 1) directly impacted by your topic, e.g., users; 2) indirectly impacted; 3) other stakeholders. • What are possible positive and negative impacts for each?
6/27	Assignment #7: Privacy & Data	• How are data collected, managed, and used in your topic? • Discuss possible improvements to these privacy practices.
7/04	No case study	
7/11	Assignment #8: Social Robotics	• Discuss ethical issues related to social robotics and AI. • In what cases might social robots be appropriate or not?
7/18	Assignment #9: Bias & Inequality	• Discuss how your topic might produce bias or inequality. • Can unfairness and inequality be addressed, and if so, through technical fixes or other strategies?
7/25	Assignment #10: Future of Work	• How might AI/automation affect the nature of work? Replacing or creating new jobs? What do you think is likely? • Note how your topic might influence the nature of work

Midterm Examination

On Tuesday, 6/16, there will be a midterm examination. The midterm will be take-home, open notes, and timed. You are encouraged to use any of the course reading, lectures, notes, and online materials. However, you should not be in contact with any other humans (classmates or individuals online). If you have any administrative or technical questions, please contact the instructor and TA.

You will have limited time to complete the exam and submit it on Canvas, but you can take the exam any time on the exam date. This is designed to give you flexibility and to account for students in different time zones.

As per the grading policy, a late midterm will result in a 1/3 penalty to the letter grade (e.g., A- to B+) if the paper is submitted that day, followed by an additional 1/3 letter grade penalty for each 24-hour delay. If you need an extension for technical or other reasons, you must reach out to the instructor and TA at least one week before the exam (06/11). We will not grant extensions or other accommodations after than that point barring extreme circumstances.

Regrading may be an option, though your final score may go up or down.

Final Project

The final product is due Tuesday, July 28. You will propose a final project idea by 6/30 before the start of class. The proposal can be under one page. You may work individually or as a group (e.g., 3-4 people). If you work in a group, please indicate all group members in your proposal by 6/30. Please indicate both your topic of interest (it can be your case study topic) and the proposed format of your final project. The instructor and TA will confirm or provide feedback.

Possible formats for the final project are a paper (~10-15 pages individually, or longer with a group), a podcast, a new piece of software or web-based tool with an explanatory report, or a recorded PPT presentation (approx. 20 mins). Feel free to be creative with the project format!

You may draw on material from your case study or from other courses or personal research/work as inspiration, but do not merely re-submit the same content or material used for another class. For example, if you have already created software for another class, you should be prepared to supplement it with a report discussing the ethical dimensions, providing guidance on how one might use the software in an applied case, etc.

The final project will be graded as follows, with 0-10 points across four dimensions for a total score between 0 and 40.

Final Project Grading Rubric

	Does not meet expectations (0-4)	Approaches expectations (5-7)	Meets or exceeds expectations (8-10)
Communication of ideas	Ideas and arguments are undeveloped, presented without evidence, and/or disorganized	Ideas and arguments are somewhat developed, supported with evidence, and exhibit organization	Ideas and arguments are well-developed, strongly supported, organized, and compelling to read
Engagement with course materials	Assignment indicates lack of engagement with core course readings and lectures	Assignment indicates understanding of fundamentals of course content	Assignment demonstrates thoughtful and creative application of course content
Creativity and presentation	Format indicates little creative work, original interpretation, or is otherwise inappropriate	Format is appropriate to the topic and demonstrates original interpretation; good presentation	Format demonstrates significant creativity; excellent presentation
Language usage / grammar*	Grammar and word choice are inappropriate	Grammar and word choice are coherent with some mistakes	Grammar and word choice are exceptional with few mistakes

* All students may request to have this not graded as indicated in Policies