

CS 3390 / DS 3390: Ethics in Data Science

Kahlert School of Computing

FALL 2023

TuTh / 03:40–5:00 PM

Warnock Engineering Building (WEB) L101

Credits: 3
Pre-requisites: C or better in CS 2420 AND Full Major or Minor status in Computer Science OR Full Major status in Data Science

Instructor: SAMEER PATIL, *Ph.D.* Associate Professor (*he/him/his*)

Office Hours: By appointment

NOTE: This syllabus is meant to serve as an outline and guide for our course. It may be modified with reasonable notice. The course schedule may be modified to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas and/or Piazza under Announcements.

Required Course Materials:

All readings and audiovisual materials for the course are freely available on the Internet and/or Canvas. Copies of presentations and handouts delivered in class will be available on Canvas. There is no assigned textbook.

Course Description:

In this course, we will explore the technical, social, and ethical ramifications of the choices we make at the different stages of the data analysis pipeline, from data collection and storage to understanding feedback loops in analysis. Through class discussions, case studies and exercises, students will learn the basics of ethical thinking in science, understand the history of ethical dilemmas in scientific work, and study the distinct challenges associated with ethics in modern data science.

Teaching and Learning Methods

This course will use active learning techniques with a significant proportion of class time devoted to discussion-oriented small-group activities pertaining to various scenarios and case studies. Students will participate actively in discussions and Q&A in class as well as on Canvas discussion boards. The discussions require prior critical engagement with the assigned reading material. Written assignments provide experience in applying the concepts for proposing solutions grounded in an ethical analysis of given real-world scenarios.

Course Outcomes:

After taking this course, students will be able to:

- describe the data science pipeline.
- describe the foundational theories of Ethics.
- explain the difference between moral responsibility and blame.
- recognize the harms upstream choices in the data science pipeline might introduce downstream.
- apply ethical theories to evaluate the (ethical) choices when designing and implementing systems for data collection and analysis.
- analyze the components of actions that are morally relevant.
- determine actionable outcomes based on an ethical analysis of a task.
- determine solutions to deal with moral distress, i.e., helplessness in the face of hierarchy and power.
- create a Code of Ethics to incorporate ethical principles in professional practice.

Course Policies:

Students are expected to be aware of and follow all specified policies for the course:

Attendance and Punctuality: Class participation is a major component of the grade for this course. Getting credit for class participation for a session requires attending that session completely. No class participation points will be awarded to those who are absent. Class participation points will be deducted for being late or leaving early. The overall score for class participation in the course will be calculated by dropping the lowest two scores from consideration. All class sessions will be held exclusively in person and will not be recorded. There is no online or hybrid option to attend the class sessions remotely.

Academic Honesty: It is expected that students adhere to the academic honesty policies and guidelines of the [University of Utah](#), the [John and Marcia Price College of Engineering](#) and the [Kahlert School of Computing](#). There is ZERO tolerance for plagiarism and academic misconduct in this course. All assignments in this course will be analyzed by a plagiarism detection service. Any assignment in which academic misconduct is detected will receive 0 points, and the incident will be reported to relevant university administrators. If a second instance of academic misconduct will result in a failing grade for the course.

Generative AI: The use of Generative AI tools, such as those based on Large-Language Models (e.g., ChatGPT, Bard, etc.), is **strictly prohibited**. All assignment submissions will be analyzed by automated tools to detect the use of generative AI. As appropriate, the instructors may ask students for oral explanation and/or elaboration for any of their Canvas Discussion posts, quiz answers, or assignment submissions and the process/reasoning used to arrive at the answers. Unsatisfactory oral responses will result in the answer receiving 0 points and may lead to further scrutiny of other assignment submissions.

Electronic Devices in Class: The use of electronic devices, including but not limited to laptops, smartphones, tablets, smartwatches, etc., is permitted only when instructed to do so for the purposes of in-class activities. Class participation points will be deducted for the use of electronic devices without permission at any other time for any other purposes.

Instructor-Student Communication: Piazza is the primary mode of communication between the instructors and the students. If appropriate, instructors may occasionally use other means of communication such as Canvas Announcements. Students are responsible for regularly monitoring these channels for course-related communication. When communicating with the instructors, ALL instructors (i.e., the professor and the teaching assistants) should be included in the original message as well as any replies so that the first person available can address the matter while everyone is kept in the loop. Please allow at least 24 hours for a response. Instructors will not respond to emails sent from non-university email addresses.

Due Dates: Students are expected to keep track of all due dates. Late submissions for in-class submissions and Canvas Discussion posts will NOT be accepted and will automatically receive 0 points. Late submissions for other assignments will receive a 10% penalty for each day past the deadline.

Assignment Submissions: Assignment submissions must adhere to the provided instructions, including specific conventions and formats. Not adhering to the instructions can result in penalties as appropriate, ranging from a reduction in points up to a score of 0 for the submission.

Communication Etiquette

When communicating in class and online with peers and instructors, students are expected to adhere to the following etiquette:

- Adhere to the guidelines posted on Canvas for respectful discussions in class and online. Online discussion threads, emails, and chats are considered equivalent to classrooms, and student behavior within those environments shall conform to the University of Utah Policy 6-400 regarding **Student Rights and Responsibilities**. Course-related e-mails, discussion threads, and other online communications are deemed to be part of the classroom. As such, the content is considered the property of the University of Utah and is subject to the University of Utah Policy 6-400 regarding **Student Rights and Responsibilities**.
- Comments and audiovisual materials posted online must be topically relevant and respectful.
- Instructors may remove online posts that are inappropriate, such as those containing angry or abusive content.
- Do not use ALL CAPS, except for titles.
- Do not overuse certain punctuation marks such as exclamation points and question marks.
- Do not assume privacy for course-related in-person or online communication unless it is mutually agreed upon in writing in advance.

Assignments with Due Dates:

Major deliverables for the course will be due as follows:

Canvas Discussion Posts	Every week
Initial Knowledge Assessment Quiz	08/28 by 11:59pm Mountain Time
Reflection: Block 1	10/05 by 11:59pm Mountain Time
Reflection: Block 2	11/09 by 11:59pm Mountain Time
Reflection: Block 3	12/07 by 11:59pm Mountain Time
Final Knowledge Assessment Quiz	12/07 by 11:59pm Mountain Time
Code of Ethics Assignment	12/10 by 11:59pm Mountain Time

NOTE: NO late submissions will be accepted for in-class quizzes and Canvas Discussions. Late submissions for other assignments will incur a 10% penalty for each day past the deadline.

Grading Weights:

The course grade will be based on the scores for the following course components weighted as indicated:

Class participation (In-class activities and quizzes)	40%
Canvas Discussions (10)	40%
Block Reflections (3)	10%
Initial Knowledge Assessment (Canvas Quiz)	0.2%
Final Knowledge Assessment (Canvas Quiz)	1.8%
Code of Ethics Assignment	8%

Grading Scale:

The letter grade for the course will be assigned according to the following scale:

A+	97%+
A	94-96.9%
A-	90-93.9%
B+	87-89.9%
B	84-86.9%
B-	80-83.9%
C+	77-79.9%
C	74-76.9%
C-	70-73.9%
D+	67-69.9%
D	64-66.9%
D-	60-63.9%
E	< 60%

NOTE: Rounding will apply only to the **2nd** digit after the decimal in the numeric scores. The first digit will NOT be rounded up.

Course Schedule:

The course topics will be covered according to the following schedule:

Week	Dates	Topic
INTRODUCTION AND BACKGROUND		
1	08/22–08/24	The Data Science Pipeline
2	08/29–08/31	Ethical Frameworks
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BLOCK 1: DATA		
3	09/05–09/07	Conceptions of Data
4	09/12–09/14	Directed vs. Undirected Data Collection
5	09/19–09/21	Privacy and Personal Property
6	09/26–09/28	Power Structures, Moral Responsibility, and Informed Consent
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BLOCK 2: ANALYSIS		
7	10/03–10/05	Analysis Basics and Extrapolation
8	–	FALL BREAK
9	10/17–10/19	Explanation
10	10/24–10/26	Weights and Answers
11	10/31–11/02	Human Interaction
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BLOCK 3: REAL-LIFE APPLICATIONS		
12	11/07–11/09	The Good (and Bad) of Machine Learning
13	11/14–11/16	The Role of Data Scientists
14	–	THANKSGIVING
15	11/28–11/30	What Actions to Take
16	12/05–12/07	Societal Changes
17	Finals Week	NO FINAL EXAM

Student Names and Personal Pronouns:

Class rosters are provided to the instructor with the student's legal name as well as "Preferred first name" (if previously entered by the student in the Student Profile section of the CIS account, which can be managed at any time). While CIS refers to this as merely a preference, the instructors will honor students by referring to them with the name and pronoun that feels best for them in class or on assignments. Please advise the instructors of any name or pronoun changes to help us create a learning environment in which you, your name, and your pronoun are respected. If you need any assistance or support, please reach out to the [LGBT Resource Center](#).

University Policies:

The course will adhere to the administrative policies and guidelines of the University of Utah, the [Price College of Engineering](#) and the [Kahlert School of Computing](#), including but not limited to the following:

The Americans with Disabilities Act. The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building (801-581-5020). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability & Access.

Given the nature of this course, in-person attendance is required and adjustments cannot be granted to allow non-attendance. All class sessions will be held exclusively in person and will not be recorded. There is no online or hybrid option to attend the class sessions remotely. However, students who need to seek an ADA accommodation to request an exception to this attendance policy due to a disability should contact the Center for Disability and Access (CDA). CDA will work with the instructors to determine what, if any, ADA accommodations are reasonable and appropriate.

University Safety Statement. The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit <https://safeu.utah.edu>.

Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building (801-581-8365) or the Office of the Dean of Students, 270 Union Building (801-581-7066). For support and confidential consultation, contact the Center for Student Wellness, 426 SSB (801-581-7776). To report to the police, contact the Department of Public Safety at 801-585-2677 (COPS).

Lauren's Promise: Lauren's Promise is a vow that anyone – faculty, staff, students, parents, and community members – can take to indicate to others that they represent a safe haven for sharing incidents of sexual assault, domestic violence, or stalking. Anyone who makes Lauren's Promise vows to: 1.) listen to and believe those individuals who are being threatened or experiencing sexual assault, dating violence or stalking; 2.) represent a safe haven for sharing incidents of sexual assault, domestic violence, or stalking; and 3.) change campus culture that responds poorly to dating violence and stalking. By making Lauren's Promise, individuals are helping to change campus cultures that respond poorly to dating violence and stalking throughout the nation.

Academic Misconduct Statement. It is expected that students adhere to University of Utah policies regarding academic honesty, including but not limited to refraining from cheating, plagiarizing, misrepresenting one's work, and/or collaborating inappropriately. **This includes the use of generative artificial**

intelligence (AI) tools without citation, documentation, or authorization. Students are expected to adhere to the prescribed professional and ethical standards of the profession/discipline for which they are preparing. Any student who engages in academic dishonesty or who violates the professional and ethical standards for their profession/discipline may be subject to academic sanctions as described in the University of Utah's [Policy 6-410 regarding Student Academic Performance, Academic Conduct, and Professional and Ethical Conduct](#), the [guidelines of the Price College of Engineering](#), and the [administrative policies of the Kahlert School of Computing](#).

Diversity Statement. The instructors stand in support of compassion, dignity, value-of-life, equity, inclusion and justice for all individuals regardless of color, race/ethnicity, sexual orientation, religion, language, socioeconomic status, ability, gender, gender identity or expression, immigration status, or any type of marginalization. We stand in support of making our society more inclusive, just, and equitable for all individuals. We stand against individual and systemic racism in all its various forms.

It is the intent of the instructors that students from diverse backgrounds and perspectives be well served by this course, student learning needs be addressed both in and out of class, and the diversity that students bring to the class be viewed as a resource, strength, and benefit. The instructors intend to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Student suggestions are encouraged and appreciated. Please let the instructors know of ways to improve the effectiveness of the course for any students or student groups. In addition, if any class meetings conflict with religious events, please let the instructors know so that we can make arrangements for you.

Undocumented Student Support Statement. Immigration is a complex phenomenon with broad impact on those who are directly affected by it as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801-213-3697 or visit <https://dream.utah.edu>.

Drop/Withdrawal Policies. Students may drop a course within the first two weeks of a given semester without any penalties. The last day to drop this course is Friday, September 1, 2023. Students may officially withdraw (W) from a class or all classes after the drop deadline through the midpoint of a course. The last day to withdraw from this course is Friday, October 20, 2023. A "W" grade is recorded on the transcript and appropriate tuition/fees are assessed. The grade "W" is not used in calculating the student's GPA. For more information pertaining to dropping and withdrawing from a course and the deadlines to withdraw from full-term, first, and second session courses, refer to the University of Utah's [Academic Calendar](#). Withdrawing from a course and other matters of registration are the student's responsibility.

Student Mental Health Resources. Rates of burnout, anxiety, depression, isolation, and loneliness have noticeably increased since the start of the COVID-19 pandemic. Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. If you need help, reach out for [campus mental health resources](#), including free counseling, trainings and other support. Consider participating in a [Mental Health First Aid](#) or other [wellness-themed training](#) provided by the [Center for Campus Wellness](#) and sharing these opportunities with your peers. For helpful resources contact the [Center for Student Wellness](#) at 801-581-7776.

Diverse Support for Students:

Student success at the University of Utah is important to everyone. The University of Utah is here for anyone who needs extra support in academics, overcoming personal difficulties, or finding community.

Student Support Services (TRIO)

TRIO federal programs are targeted to serve and assist low-income individuals, first-generation college students, and individuals with disabilities. Student Support Services (SSS) is a TRIO program for current or incoming undergraduate university students who are seeking their first bachelor's degree and need academic assistance and other services to be successful at the University of Utah.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

Student Support Services (TRIO)

801-581-7188

<https://trio.utah.edu>

Room 2075

1901 E. S. Campus Dr.

Salt Lake City, UT 84112

American Indian Students

The AIRC works to increase American Indian student visibility and success on campus by advocating for and providing student centered programs and tools to enhance academic success, cultural events to promote personal well-being, and a supportive “home-away-from-home” space for students to grow and develop leadership skills.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

American Indian Resource Center

801-581-7019

<https://diversity.utah.edu/centers/airc>

Fort Douglas Building 622

1925 De Trobriand St.

Salt Lake City, UT 84113

Black Students

Using a pan-African lens, the Black Cultural Center seeks to counteract persistent campus-wide and global anti-blackness. The Black Cultural Center works to holistically enrich, educate, and advocate for students, faculty, and staff through Black centered programming, culturally affirming educational initiatives, and retention strategies.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

Black Cultural Center

801-213-1441

<https://>

Fort Douglas Building 603

95 Fort Douglas Blvd.

Salt Lake City, UT 84113

Students with Children

Our mission is to support and coordinate information, program development and services that enhance family resources as well as the availability, affordability and quality of child care for University students, faculty and staff.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact

Center for Childcare & Family Resourc

801-585-5897

<https://childcare.utah.edu>

408 Union Building

200 S. Central Campus Dr.

Salt Lake City, UT 84112

Students with Disabilities

The Center for Disability & Access is dedicated to serving students with disabilities by providing the opportunity for success and equal access at the University of Utah. They also strive to create an inclusive, safe, and respectful environment.

For more information about what support they provide and links to other resources, view their website or contact:

Center for Disability & Access

801-581-5020

<https://disability.utah.edu>

162 Union Building

200 S. Central Campus Dr.

Salt Lake City, UT 84112

Students across Intersectional Identities and Experience

The Center for Equity & Student Belonging (CESB) creates community and advocates for academic success and belonging for students across inter-sectional identities and experiences among our African, African American, Black, Native, Indigenous, American Indian, Asian, Asian American, Latinx, Chicanx, Pacific Islander, Multiracial, LGBTQ+, Neurodiverse and Disabled students of color.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

Center for Equity and Student Belonging (CESB)

801-581-8151

<https://diversity.utah.edu/centers/CESB/>

235 Union Building

200 S. Central Campus Dr.

Salt Lake City, UT 84112

English as a Second/Additional Language (ESL) Students

If you are an English language learner, there are several resources on campus available to help you develop your English writing and language skills. Feel free to contact:

Writing Center

801-587-9122

<https://writingcenter.utah.edu>

2701 Marriott Library

295 S 1500 E

Salt Lake City, UT 84112

English Language Institute

801-581-4600

<https://continue.utah.edu/eli>

540 Arapeen Dr.

Salt Lake City, UT 84108

Undocumented Students

Immigration is a complex phenomenon with broad impact on those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles that prevent you from engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center.

Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families.

For more information about what support they provide and links to other resources, view their website or contact:

Dream Center

801-213-3697

<https://dream.utah.edu>

1120 Annex (Wing B)

1901 E. S. Campus Dr.

Salt Lake City, UT 84112

LGBTQ+ Students

The LGBTQ+ Resource Center acts in accountability with the campus community by identifying the needs of people with a queer range of [a]gender and [a]sexual experiences and responding with university-wide services.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

LGBTQ+ Resource Center

801-587-7973

<https://lgbt.utah.edu>

409 Union Building

200 S. Central Campus Dr.

Salt Lake City, UT 84112

Veterans & Military Students

The mission of the Veterans Support Center is to improve and enhance the individual and academic success of veterans, service members, and their family members who attend the university; to help them receive the benefits they earned; and to serve as a liaison between the student veteran community and the university.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

Veterans Support Center
801-587-7722
<https://veteranscenter.utah.edu>
418 Union Building
200 S. Central Campus Dr.
Salt Lake City, UT 84112

Women

The Women's Resource Center (WRC) at the University of Utah serves as the central resource for educational and support services for women. Honoring the complexities of women's identities, the WRC facilitates choices and changes through programs, counseling, and training grounded in a commitment to advance social justice and equality.

For more information about what support they provide, a list of ongoing events, and links to other resources, view their website or contact:

Women's Resource Center
801-581-8030
<https://womenscenter.utah.edu>
411 Union Building
200 S. Central Campus Dr.
Salt Lake City, UT 84112

Inclusivity at the U

The Office for Inclusive Excellence is here to engage, support, and advance an environment fostering the values of respect, diversity, equity, inclusivity, and academic excellence for students in our increasingly global campus community. They also handle reports of bias in the classroom as outlined below:

Bias or hate incidents consist of speech, conduct, or some other form of expression or action that is motivated wholly or in part by prejudice or bias whose impact discriminates, demeans, embarrasses, assigns stereotypes, harasses, or excludes individuals because of their race, color, ethnicity, national origin, language, sex, size, gender identity or expression, sexual orientation, disability, age, or religion.

For more information about what support they provide and links to other resources, or to report a bias incident, view their website or contact:

Office for Inclusive Excellence
801-581-4600
<https://inclusive-excellence.utah.edu>
170 Annex (Wing D)
1901 E.S. Campus Dr.
Salt Lake City, UT 84112

Other Student Groups at the U

To learn more about some of the other resource groups available at the U, check out:

<https://inclusive-excellence.utah.edu>

<https://studentsuccess.utah.edu/resources/student-support>