



DS 210: Data Ethics and Society

Term: Fall 2026

Credits: 3.0

Lecture Times & Location: Tuesday & Thursday 1:00–2:15 p.m., Ashby Hall 220

Modality: In-Person

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Instructor Information

- **Instructor:** Dr. Tomás Rivera (Assistant Professor of Computer Science)
- **Email:** trivera@university.alkimi.ai
- **Office:** Ashby Hall 215
- **Office Hours:**
 - Monday & Wednesday: 3:30–5:00 p.m. (In person, Ashby Hall 215)
 - Friday: 10:00–11:00 a.m. (Virtual via Zoom; link posted in Canvas)
 - Also available by appointment.

Course Description

Ethical, legal, and social dimensions of data collection, algorithmic decision-making, and artificial intelligence, with emphasis on algorithmic bias, data privacy, surveillance capitalism, and governance frameworks. Examination of technical choices, normative values, and societal impacts through philosophical analysis and practical case studies. DS 210 provides an interdisciplinary investigation into the ethical, legal, and social dimensions of data collection, algorithmic decision-making, and artificial intelligence. Expanding upon introductory programming and analytical concepts, students examine how technical choices in data curation, objective formulation, and model deployment embody normative values and generate disparate impacts across marginalized populations. Through rigorous philosophical critique, quantitative fairness auditing, and authentic case studies, students evaluate surveillance capitalism, intellectual property in foundation models, and emerging regulatory governance frameworks.

Prerequisites

CS 150 or sophomore standing. PHIL 305 recommended.

Measurable Student Learning Outcomes

Upon successful completion of DS 210, students will be able to:

1. **Analyze Normative Frameworks:** Apply major ethical theories (utilitarianism, deontology, virtue ethics, and justice frameworks) to evaluate real-world algorithmic decision systems.
2. **Quantify Algorithmic Fairness:** Calculate and critique standard statistical fairness metrics (e.g., demographic parity, equalized odds, predictive parity) and articulate their inherent mathematical and philosophical tradeoffs.
3. **Evaluate Privacy Architectures:** Assess technical and legal data privacy mechanisms, including differential privacy, k-anonymity, GDPR, FERPA, and regional consumer data privacy statutes.

4. **Critique Sociotechnical Systems:** Conduct comprehensive algorithmic impact assessments on deployed artificial intelligence systems in criminal justice, credit scoring, healthcare diagnostics, and employment screening.
5. **Formulate Policy & Governance:** Author professional technical policy briefs evaluating generative AI intellectual property rights, data provenance, and responsible disclosure protocols.

Required Course Materials & Approximate Costs

1. **Solon Barocas, Moritz Hardt, and Arvind Narayanan. *Fairness and Machine Learning: Limitations and Opportunities*. MIT Press, 2023.** Free digital open access at fairmlbook.org; optional print edition approx. \$35.
2. **Alkimi Data Ethics Coursepack: Classic Articles, Legal Statutes, and Sociotechnical Case Studies.** Free digital access provided via Canvas.
3. **Total estimated cost:** \$0 (open-access digital resources) to \$35 (optional print text).

Generative AI Policy (AI Level 2: AI Permitted with Disclosure for Specified Tasks)

In accordance with Alkimi University Academic Policies (Student Handbook §5.8), DS 210 operates under **AI Level 2**.

- **What is permitted:** You may use generative AI tools to assist in debugging Python auditing scripts, explore alternative formulations of statistical fairness definitions, and brainstorm potential edge cases for algorithmic impact evaluations.
- **What is prohibited:** You may not use generative AI to write case study analyses, generate fictional audit data, synthesize policy briefs, or complete midterm examination questions.
- **Disclosure:** Every submitted case analysis and auditing project must include a dedicated AI usage disclosure describing the specific tools consulted, prompts entered, and how outputs were independently validated.

Grading Components and Weights

- **Case Study Analyses (4):** 25% (Four analytical case evaluations (1,000–1,200 words each; 6.25% each) analyzing historical instances of algorithmic harm and data misuse)
- **Fairness & Bias Auditing Notebooks (3):** 20% (Three applied Python notebook exercises auditing datasets for demographic skew and testing algorithmic debiasing interventions)
- **Midterm Examination:** 20% (In class, Thursday, October 15)
- **Seminar Participation & Disclosures:** 10% (Active contribution to weekly seminar discussions and reflective evaluations of Generative AI tool disclosures)
- **Algorithmic Impact Capstone Project:** 25% (Due by the end of the final exam period, Monday, December 14, 2026, 1:00–3:00 p.m.)

Grading Scale (Alkimi University Standard)

- **A:** 93–100% | **A-:** 90–92%
- **B+:** 87–89% | **B:** 83–86% | **B-:** 80–82%
- **C+:** 77–79% | **C:** 73–76% | **C-:** 70–72%
- **D+:** 67–69% | **D:** 60–66% | **F:** Below 60%
- **Extra credit:** No individual extra credit assignments are offered in DS 210. Final grades are calculated strictly from the graded assessment components listed on this syllabus.

Course Schedule (Fall 2026)

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 1	Aug 27	The Sociotechnical Perspective and Ethical Foundations: Introduction to sociotechnical systems, normative values embedded in code, and the moral responsibilities of data scientists and software engineers. <i>Reading: Barocas et al., Ch. 1; Shannon Vallor, *Technology and the Virtues (excerpt)*</i>	<i>First day of classes: Wed Aug 26.</i>
Week 2	Sep 1, 3	Philosophical Frameworks: Deontology, Consequentialism, and Justice: Utilitarianism, deontology (Kant), virtue ethics, and John Rawls's theory of justice as fairness applied to automated decision systems. <i>Reading: Alkimi Coursepack: Ethical Theories Primer; Michael Sandel, *Justice (excerpt)*</i>	<i>Wed Sep 2: Add/section change deadline.</i>
Week 3	Sep 8, 10	Statistical Fairness Criteria: Definitions and Measures: Defining and calculating group fairness metrics: demographic parity, equal opportunity, equalized odds, and predictive value parity. <i>Reading: Barocas et al., Ch. 2; Case Study 1 Assigned</i>	<i>Mon Sep 7: Labor Day (no classes). Wed Sep 9: Census date (last day to drop without a W).</i>
Week 4	Sep 15, 17	Impossibility Theorems and Inherent Fairness Tradeoffs: Kleinberg's impossibility theorem, Chouldechova's proof, and the mathematical and philosophical incompatibilities among fairness criteria. <i>Reading: Barocas et al., Ch. 3; Kleinberg et al. (2016)</i>	—
Week 5	Sep 22, 24	Criminal Justice and Risk Assessment: The COMPAS Case: Analysis of COMPAS and predictive recidivism algorithms; racial disparity, feedback loops, and judicial discretion. <i>Reading: Angwin et al. (ProPublica, 2016); Flores et al. (2016); Bias Audit 1 Assigned</i>	—
Week 6	Sep 29, Oct 1	Automated Hiring, Lending, and Disparate Impact: Credit scoring algorithms, resume screening, natural language bias in recruiting, and disparate impact under US civil rights law. <i>Reading: Barocas et al., Ch. 4; O'Neil, *Weapons of Math Destruction (Ch. 8)*</i>	—
Week 7	Oct 6, 8	Healthcare Diagnostics, Triage, and Proxy Variables: Algorithmic triage in commercial healthcare, racially biased proxy variables, and health equity in diagnostic AI models. <i>Reading: Obermeyer et al. (Science, 2019); Case Study 2 Assigned</i>	—
Week 8	Oct 15	Midterm Examination and Synthesis (Fall Break Week): Comprehensive conceptual review of weeks 1–7 followed by in-class midterm examination covering philosophical theories, fairness metrics, and legal cases. <i>Reading: Study guide and review materials; Midterm Examination in class</i>	<i>Oct 12–Oct 13: Fall break (no classes). Fri Oct 16: Midterm grades due. Midterm Examination (in class).</i>
Week 9	Oct 20, 22	Data Privacy: Re-identification, Linkage Attacks, and k-Anonymity: De-identification, linkage attacks, the Latanya Sweeney medical record study, k-anonymity, l-diversity, and t-closeness. <i>Reading: Barocas et al., Ch. 5; Sweeney (2002); Bias Audit 2 Assigned</i>	—
Week 10	Oct 27, 29	Differential Privacy and Privacy-Preserving Analytics: Formal mathematical definitions of differential privacy, privacy budgets (epsilon), randomized response, and the 2020 US Census implementation. <i>Reading: Dwork & Roth (2014, excerpts); Abowd (2018)</i>	—
Week 11	Nov 3, 5	Surveillance Capitalism and Behavioral Data Harvesting: The extraction of behavioral surplus, targeted advertising ecosystems, data broker pipelines, and smart device telemetry. <i>Reading: Shoshana Zuboff, *The Age of Surveillance Capitalism (Ch. 1–3); Case Study 3 Assigned*</i>	<i>Fri Nov 6: Last day to withdraw (W) or elect Pass/No Pass.</i>

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 12	Nov 10, 12	Facial Recognition, Biometrics, and Civil Liberties: Biometric surveillance, error disparities across race and gender in computer vision, spatial tracking, and Fourth Amendment jurisprudence. <i>Reading: Buolamwini & Gebru (Gender Shades, 2018); Joy Buolamwini, *Unmasking AI</i>	—
Week 13	Nov 17, 19	Generative AI, Web Scraping, and Intellectual Property: Large language models, web scraping without consent, copyright lawsuits, hallucination, and intellectual property claims in generative AI. <i>Reading: Bender et al. (Stochastic Parrots, 2021); Bias Audit 3 Assigned</i>	—
Week 14	Nov 24	Labor Exploitation and Environmental Costs of AI (Thanksgiving Week): Global ghost work, data labeling annotation sweatshops, energy consumption of training runs, and water cooling demands of data centers. <i>Reading: Gray & Suri, *Ghost Work (Ch. 2); Kate Crawford, Atlas of AI (Ch. 1–2)*</i>	Nov 25–Nov 27: Thanksgiving break (no classes).
Week 15	Dec 1, 3	Algorithmic Governance, Auditing Standards, and Regulatory Policy: The European Union AI Act risk tiers, FTC enforcement actions against algorithmic deception, and algorithmic impact assessment frameworks. <i>Reading: EU AI Act summary; NIST AI Risk Management Framework; Case Study 4 Assigned</i>	—
Week 16	Dec 8	Professional Responsibility, Whistleblowing, and Capstone Synthesis: Technical whistleblowing, worker organizing, professional codes of ethics (ACM/IEEE), and student presentation of capstone audit findings. <i>Reading: ACM Code of Ethics; Capstone Project due during finals period</i>	Wed Dec 9: Last day of classes. Thu Dec 10: Reading Day.
Finals	Dec 14	Algorithmic Impact Capstone Project due by the end of the scheduled final exam period, Monday, December 14, 2026, 1:00–3:00 p.m.	No final examination.

Course Policies

Attendance Policy

Because DS 210 functions as an interdisciplinary seminar and hands-on case discussion, regular and punctual attendance is essential. You are permitted two unexcused absences during the semester without academic penalty. Each additional unexcused absence will reduce your final course grade by one third of a letter grade. Missing more than five class sessions will result in an automatic failing grade for the course. Students who miss the first two class meetings without notifying the instructor may be dropped. Students may miss class for religious observance without penalty if they notify the instructor in writing within the first two weeks of the semester (by Wednesday, September 9, 2026). Absences for university-sponsored activities (athletics, performances, conferences) are excused with a letter from the sponsoring office at least one week in advance.

Late Work Policy

Written case analyses and auditing notebook projects lose 10% per calendar day overdue and will not be accepted after three days past the deadline. In-class exercises and examinations cannot be submitted late without advance written approval for an excused absence.

Final Exam Policy

DS 210 has no final examination. The algorithmic impact capstone project takes its place. Nothing is due on Reading Day (Thursday, December 10, 2026).

Academic Integrity

Alkimi University is an academic community devoted to rigorous scholarship, open intellectual inquiry, and uncompromising ethical conduct. All students are subject to the regulations of the Alkimi University Academic Integrity Policy. Academic dishonesty—including plagiarism, cheating on examinations, unauthorized collaboration, fabrication of empirical data, and unauthorized submission of academic work generated by artificial intelligence—undermines the integrity of the university and carries severe disciplinary sanctions. Sanctions range from a failing grade on an assignment or exam to an administrative course failure recorded as an 'XF' on the official transcript, academic suspension, or expulsion. Suspected violations are formally investigated and resolved through the Office of Academic Integrity in accordance with Faculty Handbook §6. For detailed information, consult the Office of Academic Integrity, Lovell Hall 315, (555) 555-0163, integrity@university.alkimi.ai.

Accessibility Services

Alkimi University is committed to providing equitable educational access and reasonable accommodations for all students with documented disabilities, including physical, sensory, psychological, learning, and chronic health conditions. Students requesting academic accommodations must formally register with the Office of Accessibility Services, Harlan Hall 204, (555) 555-0155, access@university.alkimi.ai. Once approved, students will receive an official Faculty Accommodation Letter detailing approved accommodations. Students should present this letter to the instructor as early in the semester as possible, and at least one week prior to any exam or assignment requiring accommodation. Accommodations cannot be applied retroactively.

Student Wellness and Mental Health

Your physical health, psychological well-being, and mental health are essential to your academic success. If you experience heightened stress, anxiety, depressive symptoms, personal trauma, or academic burnout, free, confidential counseling and medical care are available through the Hollis Health & Counseling Center, located in the Hollis Center. Routine appointments are available Monday–Friday 8:00 a.m.–6:00 p.m. and Saturday 10:00 a.m.–2:00 p.m. during the semester by calling (555) 555-0190 or emailing health@university.alkimi.ai. Urgent, 24/7 crisis psychological counseling is accessible immediately at (555) 555-0199.

Campus Student Support Services

- **Academic Advising Center:** Lovell Hall 101 | (555) 555-0158 | advising@university.alkimi.ai
- **Writing Center:** Whitcombe Library 3rd Floor | Free consultations on papers, reports, and research projects at any stage.
- **Whitcombe Library:** Whitcombe Library, Main Floor | (555) 555-0170 | askalibrarian@university.alkimi.ai
- **Hollis Health & Counseling Center:** Hollis Center | (555) 555-0190 | 24/7 Counseling Line: (555) 555-0199 | health@university.alkimi.ai
- **The Writing Center:** Whitcombe Library 3rd Floor | Consultations on technical policy briefs, ethical case studies, and analytical essay drafting.