



**School of Communication and Information  
Department of Library and Information Science**

**Critical Algorithm Studies**

Master of Information program elective  
SC&I 17:610:590:01 (3 credits)  
Fall 2019

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**CATALOG DESCRIPTION**

This class provides an introduction to the role that algorithms increasingly play in daily life, addressing the social forces that both shape and are shaped by algorithms. Although algorithms are not new, their development and use has accelerated in recent years, resulting in a critical mass of academic literature on the topic. The course takes a multidisciplinary approach to interrogating algorithms, drawing primarily on literature from information science, computer science, and

science and technology studies, with additional readings from disciplines such as philosophy, law, and public health. After completing this course, students will be able to critically engage with the role of algorithms in society on both theoretical and practical levels.

#### PRE- AND CO-REQUISITES

None.

#### LEARNING OBJECTIVES

Upon completion of this course, students will be able to:

1. Possess working knowledge of theoretical perspectives on algorithms and society;
2. Explain content, interactions, and behaviors that shape and are shaped by algorithms;
3. Recognize and analyze the values and goals that inform the construction of algorithms;
4. Apply these theoretical and practical understandings of algorithms and society to analyze current events and emerging issues;
5. Talk to their colleagues, family, friends, and peers about the role of algorithms in daily life.

#### ASSIGNMENTS

We will discuss these assignments extensively during our first class session.

- Your main assignment is to do the readings every week and to come in prepared to discuss them as an active participant in class.
- Early on in the semester, you will be asked to give a short presentation on something that you don't know about algorithms and want to learn more about.
- During one week in the semester, you will be responsible for moderating the class discussion. You'll select your week during our first class meeting.
- After week five, every week you will find and share at least two articles about algorithms in the news in a group spreadsheet available to the whole class. You should be prepared to discuss them with the class as appropriate.
- You will also write an essay at the end of the semester about a topic of your choice related to the course. Midway through the class, I'll ask you to turn in a one-page synopsis and plan for your essay.
- Finally, you will be responsible for assessing your knowledge and progress throughout the course and will turn in a self-assessment upon completing the class.

This is a discussion-based, seminar-style class. All written assignments must be turned in by email and are due 24 hours before our class meeting that week. **Please use the following filename convention to submit your written assignments: Lastname\_Assignment-title.docx or .pdf.**

*The assignments in this class were greatly informed by the hard work and generous sharing of numerous other scholars, including Dr. Casey Fiesler, Dr. Danya Glabau, Dr. John MacNeill Miller, and Dr. Jesse Stommel.*

Assignment	Importance	Date due
Class participation	•••••	Ongoing
Class moderation	••••	TBD
What don't you know about algorithms?	•	September 12
Algorithms in the news	•••	Weekly, starting October 2
Check-in for final essay	•	October 23
Final essay	••••	December 12 (presentation) December 19 (essay)
Self-assessment	•	December 19

## METHODS OF ASSESSMENT AND GRADING

*“Grades make the complexity of human interactions within a learning environment machine-readable.” –Jesse Stommel (paraphrased)*

This class uses a qualitative approach, not a quantitative approach, to grading. We will discuss these approaches extensively in class, both in reference to your own work and to the work that we are studying. I will be giving you qualitative feedback in the form of comments, suggestions, and questions about your work throughout the semester. At the end of the semester, you will complete a self-assessment and will assign yourself a grade based on the evidence you present in that assessment. I reserve the right to change your final grade as appropriate. If you feel anxious about this, you can always contact me or come see me to discuss your progress in the class. If you are worried about your grade, **your best strategy in class is to do the reading, join our discussions, and complete the assignments.** There is no work in this class that exists just for the purpose of handing something in (sometimes called “busy work”). If an assignment does not feel productive to you, we will find ways to modify it.

## DUE DATES AND EXTENSIONS

Everything that you write is due at least 24 hours before the start of class, including your selection of news articles for class discussion. If you need an extension on a project, just let me know before the due date via email. In your email, tell me when you will turn in the assignment. The only assignment where I will not grant extensions is in your selection of news articles about algorithms each week. **You don't have to give me any reason or justification for giving yourself up to a week of extra time for any of the other assignments in this class.** If you turn *everything* in a week later than requested, however, I will notice and this will impact your participation grade. Note that my feedback may be back to you a bit later if you turn things in after their stated due date.

## READING AND PARTICIPATING IN THIS CLASS

Our readings in this class are all available as links in this syllabus or as book chapters.

This class is readings-intensive. **We will discuss how to read these articles during our first class session.** This is a seminar-style class, where the majority of our time together is spent discussing the week's articles. So, **please do all of the readings before each class date for which they are listed** and come prepared to engage in substantive discussion with the rest of the class.

**To prepare for discussions as you read, ask yourself questions like:** What did you find particularly interesting? What did you learn? Were there things that were unsurprising to you? Did you like the reading? Why, or why not? How do the concepts and findings from the articles relate to everyday life? To your professional life? Do the findings make sense? What information did you find useful? Were the articles problematic in any way? How so? Was there anything particularly difficult to understand? How do the readings from one week relate to the readings from previous sessions? And so on.

### **COURSE SCHEDULE AND CALENDAR**

For each week, complete the listed readings **before** our class meetings so that we can discuss them in class. All readings on this list are required.

#### WEEK 1, SEPTEMBER 5: WHAT IS AN ALGORITHM?

1. Bucher, T. (2018). **Chapter 2:** "The multiplicity of algorithms." From *If...Then: Algorithmic Power and Politics*. Oxford University Press.
2. boyd, d., & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. *Information, Communication & Society*, 15(5), 662–679. <https://www-tandfonline-com.proxy.libraries.rutgers.edu/doi/pdf/10.1080/1369118X.2012.678878>

#### WEEK 2, SEPTEMBER 12: ANATOMY AND INFRASTRUCTURE

*We'll be talking about things we don't know about algorithms today in class. Be prepared with a 4-5 minute overview. No slides or handouts are necessary, but they can be useful to provide.*

1. D'Ignazio, C., & Klein, L. (2018). Chapter One: Bring Back the Bodies. From *Data Feminism*. <https://bookbook.pubpub.org/pub/zrlj0jqb>
2. Plantin, J.-C., Lagoze, C., Edwards, P. N., & Sandvig, C. (2018). Infrastructure studies meet platform studies in the age of Google and Facebook. *New Media & Society*, 20(1), 293–310. <https://journals-sagepub-com.proxy.libraries.rutgers.edu/doi/full/10.1177/1461444816661553>
3. Crawford, K., & Joler, V. (2018). Anatomy of an AI System—The Amazon Echo as an anatomical map of human labor, data, and planetary resources. <https://anatomyof.ai/>

### WEEK 3, SEPTEMBER 19: CLASSIFICATION

*Our class has a reserved set of seats at the Colonized by Data event on Monday, September 16<sup>th</sup> from 1:10-2:20 PM held in the Student Center on College Avenue in the Multi-purpose Room. Attendance is strongly encouraged and will be factored into your participation assessment.*

1. Bowker, G. C., & Star, S. L. (2000). **Introduction and Chapter One:** “To classify is human” and “Some tricks of the trade in analyzing classification.” From *Sorting Things Out: Classification and Its Consequences*. Cambridge, Massachusetts London, England: The MIT Press. (p. 1-50).
2. D’Ignazio, C., & Klein, L. (2018). **Chapter Three:** “What Gets Counted Counts.” From *Data Feminism*. <https://bookbook.pubpub.org/pub/rykakh1>

#### *Recommended:*

Broussard, M. (2018). **Chapter 7:** “Machine learning.” From *Artificial Unintelligence: How Computers Misunderstand the World*. Cambridge, Massachusetts: The MIT Press.

### WEEK 4, SEPTEMBER 26: BIAS

1. *The Myth of the Impartial Machine* (interactive): <https://parametric.press/issue-01/the-myth-of-the-impartial-machine/>
2. Eubanks, V. (2018). **Chapter 4:** “The Allegheny Algorithm.” From *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York, NY: St. Martin’s Press.
3. Noble, S. (2018). **Chapter 2:** “A society, searching.” From *Algorithms of Oppression: How Search Engines Reinforce Racism*. New York: NYU Press.

### WEEK 5, OCTOBER 3: FAIRNESS AND EQUITY

*Our algorithms in the news assignments begin this week. Be sure to add at least two articles from the past three months about the course topic to our group spreadsheet, and be prepared to talk about them in class as appropriate. These are due every week moving forward.*

1. Selbst, A. D., Boyd, D., Friedler, S. A., Venkatasubramanian, S., & Vertesi, J. (2019). Fairness and Abstraction in Sociotechnical Systems. *Proceedings of the Conference on Fairness, Accountability, and Transparency*, 59–68. <https://dl-acm-org.proxy.libraries.rutgers.edu/citation.cfm?id=3287598>
2. Hoffmann, A. L. (2019). Where fairness fails: Data, algorithms, and the limits of antidiscrimination discourse. *Information, Communication & Society*, 22(7), 900–915. <https://www-tandfonline-com.proxy.libraries.rutgers.edu/doi/full/10.1080/1369118X.2019.1573912>

3. Madden, M., Gilman, M., Levy, K., & Marwick, A. (2017). Privacy, Poverty, and Big Data: A Matrix of Vulnerabilities for Poor Americans. *Washington University Law Review*, 95(1), 053–125. [https://openscholarship.wustl.edu/law\\_lawreview/vol95/iss1/6/](https://openscholarship.wustl.edu/law_lawreview/vol95/iss1/6/)

#### WEEK 6, OCTOBER 10: ACCOUNTABILITY

1. Nissenbaum, H. (1994). Computing and accountability. *Communications of the ACM*, 37(1), 72–80. <https://doi.org/10.1145/175222.175228>
2. Dillon Reisman, Jason Schultz, Kate Crawford, and Meredith Whittaker. 2018. *Algorithmic impact assessments: A practical framework for public agency accountability*. <https://ainowinstitute.org/aiareport2018.pdf>.
3. Diakopoulos, N., Friedler, S., Arenas, M., Barocas, S., Hay, M.... & Zevenbergen, B. (2018). *Principles for Accountable Algorithms and a Social Impact Statement for Algorithms*. <https://www.fatml.org/resources/principles-for-accountable-algorithms>
4. Currie, M., Paris, B. S., Pasquetto, I., & Pierre, J. (2016). The conundrum of police officer-involved homicides: Counter-data in Los Angeles County. *Big Data & Society*, 3(2). <https://journals-sagepub-com.proxy.libraries.rutgers.edu/doi/full/10.1177/2053951716663566>

#### WEEK 7, OCTOBER 17: GUEST LECTURE

#### WEEK 8, OCTOBER 24: NO CLASS MEETING, ANNUAL ASIS&T CONFERENCE

*This week, you will send me a short, informal description of your final essay topic, along with your plans for researching and writing your essay.*

#### WEEK 9, OCTOBER 31: THE HUMAN IN THE LOOP

1. West, S.M., Whittaker, M. and Crawford, K. (2019). *Discriminating Systems: Gender, Race and Power in AI*. AI Now Institute. <https://ainowinstitute.org/discriminatingystems.pdf>
2. Irani, L. (2015). The cultural work of microwork. *New Media & Society*, 17(5), 720–739. <https://journals-sagepub-com.proxy.libraries.rutgers.edu/doi/full/10.1177/1461444813511926>
3. Rosenblat, A., & Stark, L. (2016). Algorithmic labor and information asymmetries: A case study of Uber’s drivers. *International Journal of Communication*, 10, 27. <https://ijoc.org/index.php/ijoc/article/view/4892/1739>
4. Mateescu, A., & Elish, M. C. (2019). AI in context: The labor of integrating new technologies. Retrieved from <https://apo.org.au/node/217456>

#### WEEK 10, NOVEMBER 7: SURVEILLANCE, RECOGNITION, PREDICTION

1. Levinson-Waldman, R. (2017). Hiding in Plain Sight: A Fourth Amendment Framework for Analyzing Government Surveillance in Public. *Emory Law Journal*, 66 Emory L.J. 527. <http://law.emory.edu/elj/content/volume-66/issue-3/articles/hiding-plain-fourth-amendment-government-surveillance-public.html>

2. Keyes, O. (2018). The Misgendering Machines: Trans/HCI Implications of Automatic Gender Recognition. *Proceedings of the ACM on Human-Computer Interaction*, 2(CSCW), 1–22. <https://dl-acm-org.proxy.libraries.rutgers.edu/citation.cfm?id=3274357>
3. Chammah, M. (2016, February 3). Policing the Future [VIDEO and essay]. <http://www.theverge.com/2016/2/3/10895804/st-louis-police-hunchlab-predictive-policing-marshall-project>

#### WEEK 11, NOVEMBER 14: RECOMMENDING, NUDGING

1. Crawford, K. (2016). Can an Algorithm be Agonistic? Ten Scenes from Life in Calculated Publics. *Science, Technology, & Human Values*, 41(1), 77–92. <https://journals-sagepub-com.proxy.libraries.rutgers.edu/doi/full/10.1177/0162243915589635>
2. Seaver, N. (2018). Captivating algorithms: Recommender systems as traps. *Journal of Material Culture*, online first. <https://journals-sagepub-com.proxy.libraries.rutgers.edu/doi/full/10.1177/1359183518820366>
3. Lanzing, M. (2019). “Strongly Recommended”: Revisiting Decisional Privacy to Judge Hypernudging in Self-Tracking Technologies. *Philosophy & Technology*, 32(3), 549–568. <https://link-springer-com.proxy.libraries.rutgers.edu/article/10.1007/s13347-018-0316-4>

#### WEEK 12, NOVEMBER 21: BODIES

1. Benthall, S., & Haynes, B. D. (2019). Racial Categories in Machine Learning. *Proceedings of the Conference on Fairness, Accountability, and Transparency*, 289–298. <https://arxiv.org/pdf/1811.11668.pdf>
2. Buolamwini, J., & Gebru, T. (2018). Gender shades: Intersectional accuracy disparities in commercial gender classification. *Conference on Fairness, Accountability and Transparency*, 77–91. Retrieved from <http://proceedings.mlr.press/v81/buolamwini18a.html>
3. Eveleth, R. (2019). BODIES: InkRx [Podcast]. <https://www.flashforwardpod.com/2019/05/21/bodies-inkrx/>

#### WEEK 13, NOVEMBER 26: CAPITAL

*Note: Class meets Tuesday, November 26 to accommodate Thanksgiving this week.*

1. Kim, P. T. (2016). Data-Driven Discrimination at Work. *William & Mary Law Review*, 58, 857. <https://heinonline-org.proxy.libraries.rutgers.edu/HOL/Page?handle=hein.journals/wmlr58&id=887&collection=journals>
2. Nopper, T. (2019). **Chapter 7:** “Digital character in the scored society.” In R. Benjamin (Ed.), *Captivating Technology: Race, Carceral Technoscience, and Liberatory Imagination in Everyday Life* (pp. 170–187). Durham: Duke University Press Books.

## WEEK 14, DECEMBER 5: ALGORITHMIC FUTURES

1. Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G., ... Kraus, S. (2016). Artificial intelligence and life in 2030. One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel. <https://ai100.stanford.edu/2016-report>
2. Benjamin, R. (2016). Designer and discarded genomes: An experiment with speculative methods over time. E-Flux. <https://www.e-flux.com/architecture/superhumanity/66875/designer-and-discarded-genomes/>
3. Chiang, T. (2019). "What's expected of us" and "Anxiety is the dizziness of freedom." From *Exhalation: Stories*. New York: Knopf. [p. 58-61, 270-340].

## WEEK 15, DECEMBER 12: COURSE WRAP-UP AND FINAL PRESENTATIONS

*Come to class prepared to discuss your final essay. We'll also spend time together on a collective assessment of the course that you can use to help guide your self-assessment due on the 19<sup>th</sup>. Your final essay is also due on the 19<sup>th</sup>.*

### **OTHER CLASS INFORMATION AND POLICIES**

Our weekly meetings are an awesome opportunity to talk with smart people about interesting stuff. I can't tell you how much I have learned from in-class discussions as a professor. We all have a variety of personal and professional experiences that relate to this class, and our discussions will provide lots of opportunities to share these experiences and to learn from one another.

You're expected to attend all classes; if you need to miss class, please email me at [k.costello@rutgers.edu](mailto:k.costello@rutgers.edu). You don't need to give me an excuse or reason for missing a class. However, missing more than one class is generally not in your best interest (nor is it in the interest of the class, since your participation is what makes the class function). Therefore, I will reach out and want to speak with you about what's going on if you miss more than one of our class sessions. There is no penalty for missing class for religious observances, but please do let me know that you will be missing class beforehand.

The use of digital devices for class-related purposes is encouraged so that you can take notes, review readings, and search for information related to the course during our meetings. Please do not use your device for off-topic activities.

### LIBRARY RESOURCES

Rutgers University Libraries offer numerous resources to assist students. Librarians can help guide you through research and reference tools. A series of [LibGuides](#) are available to get you started.

### ACADEMIC INTEGRITY

I take academic integrity seriously, and the consequences of scholastic dishonesty are severe. Rutgers' academic integrity policy is at <http://academicintegrity.rutgers.edu/>. Multimedia presentations about academic integrity may be found at

<http://www.scc.rutgers.edu/douglass/sal/plagiarism/intro.html> and  
[http://wps.prenhall.com/hss\\_understand\\_plagiarism\\_1/0,6622,427064-,00.html](http://wps.prenhall.com/hss_understand_plagiarism_1/0,6622,427064-,00.html)

Academic integrity means, among other things:

- Develop and write all of your own assignments.
- Show in detail where the materials you use in your papers come from. Create citations whether you are paraphrasing authors or quoting them directly. Be sure always to show source and page number within the assignment and include a reference list at the end of all of your assignments.
- Do not look over at the exams of others or use electronic equipment such as cell phones during exams.
- Do not fabricate information or citations in your work.
- Do not facilitate academic dishonesty for another student by allowing your own work to be submitted by others.

Adherence to the principles of academic integrity matters for many reasons, including:

- Giving everyone their proper credit for ideas, words, results, and accomplishments.
- Making it possible for the proper evaluation of student work and ensuring that no students have inappropriate advantages over others.
- Upholding and maintaining the reputation of the University for integrity in teaching, research, and scholarship.

If you are doubtful about any issue related to plagiarism or scholastic dishonesty, please discuss it with me.

#### SERVING STUDENTS WITH DISABILITIES

Students with documented disabilities who wish accommodations in this class must do so through the Rutgers Disabilities Services Office. See <http://disabilityservices.rutgers.edu/> for details. SC&I Assistant Dean Kevin Ewell < [kevin.ewell@rutgers.edu](mailto:kevin.ewell@rutgers.edu) > will coordinate your services locally. Student who develop disabling medical problems or other issues during the semester that affect your ability to complete coursework should request advising from SC&I Assistant Dean Kevin Ewell.

#### WEATHER AND OTHER EMERGENCIES

The university rarely cancels classes for inclement weather. To check if classes are cancelled, visit <http://campusstatus.rutgers.edu/>. You can also try to call 732-932-7799. During severe weather conditions, announcements are made over the following radio stations: WCTC (1450AM), WMGQ (98.3FM), WRSU (88.7FM), WMCA (570AM), WOR (710AM), WCBS (880AM), WABC (770AM), WBGO (83.3FM), WHWH (1350AM), WPST (97.5FM), WJLK (1310FM), WMTR (1250AM).

## TECHNICAL INFORMATION

Students are expected to take the initiative to become aware of university policies and services that will help them succeed in their academic work. You are responsible for following the guidelines specified in the university's academic integrity policy, procuring information literacy skills needed to succeed in academics, seeking advisement when needed, and taking advantage of support services. SC&I IT Services offers help with a variety of technology problems. They are located in the SC&I Building in Room 120 (first floor); 848-932-5555; [help@comminfo.rutgers.edu](mailto:help@comminfo.rutgers.edu).

## BIOGRAPHICAL INFORMATION ABOUT THE INSTRUCTOR

I'm Dr. Kaitlin L. Costello; my pronouns are they/them. You can call me Dr. Costello or Dr. C in class. My main area of research is health information practice, and articles about my studies have been published in various academic journals like The Journal of the Association for Information Science and Technology, The Journal of Documentation, Patient Education and Counseling, and The Journal of Medical Internet Research. My current studies are about contact tracing for mental health, information work in chronic pain, and patients on dialysis and their information practices. I'm an LGBTQ+ faculty/staff liaison for the School of Communication and Information at Rutgers.