**Algorithmic Awareness**

Syllabus

\*Open Educational Resource Course Template Syllabus for Reuse

**Mon., Wed., Fri. 1:10-3:30 in TBD**

Fall 2020

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***Course Description***

This course explores how our technological experiences are increasingly mediated by algorithms - the code and computational processes embedded into our software. Recent work by scholars, such as Dr. Safiya Umoja Noble, have shown how algorithms exhibit implicit biases and reify societal prejudices. Moreover, the technical nature of algorithms and the lack of transparency surrounding them can be a challenge for novices. We, and our patrons, routinely engage in systems that predict, recommend, and speculate about our interests based on the digital fingerprint we provide with our link clicks and “likes”, but we all struggle understanding how and why those systems work as they do. In seeking to understand common systems, like the Facebook news feed or the Google search engine results page, we will discover the scope and reach of algorithms. We are looking for ways to address a gap in our field: a lack of an understanding around the rules that govern our software and shape our digital experiences. Throughout this course, we will explore some of the possibilities around a new competency termed “Algorithmic Awareness”.

***Course Goals***

Students who complete this course successfully will be able to:

* Describe and define the term *algorithm*
* Contextualize basic mathematical formulas and codes within algorithms
* Explain and contextualize the foundational concepts such as the Binary Search Tree algorithm and Dijkstra's algorithm.
* Consider and describe a variety of systems that utilize algorithms and the resulting effects within that system
* Discuss the implications of gender and racial diversity within algorithmic systems
* Describe the ethical ramifications of current and future algorithmic programs
* Explain the importance of algorithmic awareness
* Identify how algorithms have authority

***Required Texts***

**Books**

José Van Dijck, *The Culture of Connectivity: A Critical History of Social Media*

Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*

Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information*

**Articles**

Bogost, Ian, "The Cathedral of Computation", The Atlantic <https://www.theatlantic.com/technology/archive/2015/01/the-cathedral-of-computation/384300/>

Clark, Jason A. "Anticipatory Design: Improving Search UX using Query Analysis and Machine Cues." [http://dx.doi.org/10.3998/weave.12535642.0001.402](http://dx.doi.org/10.3998/weave.12535642.0001.402.)

Diakopoulos, Nicholas, “Algorithmic Accountability: On the Investigation of Black Boxes” <https://towcenter.org/research/algorithmic-accountability-on-the-investigation-of-black-boxes-2/>

Ekström, Andreas. “The Moral Bias Behind Your Search Results.” [www.ted.com/talks/andreas\_ekstrom\_the\_moral\_bias\_behind\_your\_search\_results](http://www.ted.com/talks/andreas_ekstrom_the_moral_bias_behind_your_search_results).

Haynes, Marie. “Your Google Algorithm Cheat Sheet: Panda, Penguin, and Hummingbird” <https://moz.com/blog/google-algorithm-cheat-sheet-panda-penguin-hummingbird>

Hillis, Ken, Michael Petit, and Kylie Jarrett, [“What Is in PageRank? A Historical and Conceptual Investigation of a Recursive Status Index”](http://computationalculture.net/article/what_is_in_pagerank) <http://computationalculture.net/what_is_in_pagerank/>

\*Noble, Safiya Umoja. “Missed Connections: What Search Engines Say About Women.” safiyaunoble.files.wordpress.com/2012/03/54\_search\_engines.pdf.

O'Neil, Cathy. "Do Algorithms Perpetuate Human Bias?" <https://www.npr.org/2018/01/26/580617998/cathy-oneil-do-algorithms-perpetuate-human-bias>

Pariser, Eli. "The Filter Bubble." <https://www.youtube.com/watch?v=B8ofWFx525s>

Reidsma, Matthew. “Algorithmic Bias in Library Discovery Systems.” <https://matthew.reidsrow.com/articles/173>

Seaver, Nick, “Knowing Algorithms” <https://static1.squarespace.com/static/55eb004ee4b0518639d59d9b/t/55ece1bfe4b030b2e8302e1e/1441587647177/seaverMiT8.pdf>

Slavin, Kevin. "How Algorithms Shape Our World." <https://www.ted.com/talks/kevin_slavin_how_algorithms_shape_our_world>

Striphas, Ted, “What is an Algorithm?” <http://culturedigitally.org/2012/02/what-is-an-algorithm/>

***Daily Work/Homework* (10%)**

Each class will begin with 15 to 30 minutes of content followed by seminar-style discussion. All readings must be completed before the beginning of each class in addition to a 3-2-1. Each 3-2-1 will contain three things you learned from the material, two questions you had, and one thing you will never forget. The format is flexible but should be NO MORE THAN one page. These will be turned in at the end of class and count for 10% of your final grade.

***Major Assignments: Descriptions***

There will be two major projects and a final throughout this course. All papers should be typed, carefully proofread, have proper citations, and turned in to the Assignments in D2L with 12-point font, double spaced.

The first will be a case study presentation revolving around an algorithmic mishap. You will prepare a 3-5-minute speech regarding this topic to be presented in class. This presentation should include a detailed outline along with your sources to be turned in with proper formatting. You will be graded on preparation, organization, demonstration of understanding of the materials, and demonstration of time management. Students should NOT read word for word from a paper and those most successful will be creative, clear, and concise (15% of your grade).

The second will be a reflective journal that identifies your thinking, understanding, and should refer to lectures and discussion throughout the semester. You might address any personal growth, cite readings that changed your mind/reinforced your convictions, or reflect on the importance of algorithmic awareness. This paper should be thorough and link your formal learning to personal meaning. Length should be at least 5 pages and no more than 8 pages (25% of your grade).

The final will be a research essay encompassing Algorithmic Awareness. You will attempt to answer a question in regards to what you found most interesting about this course. You may use one of the class articles or books as a starting point, but should do some of your own research deeper into the subject. The most successful students will present all sides of an argument, have clear structure, and a logical flow to their paper. You are required to submit your research question three weeks in advance in order to promote time management. Although you may adjust your question after-the-fact, it is recommended you choose one you like and stick with it. The week before finals will be a chance to give peer feedback in-class, so a rough draft is due. The essay will be 8-10 pages long. (40% of your grade)

***Class Participation*** (10%)

Attendance and participation are required to succeed in this course. Counting for 10% of your final grade, you are expected to listen, ask questions, and contribute during class discussions.

All participants will conduct themselves respectfully while creating an inclusive learning environment for all students.

***Course Grading***

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| --- | --- | --- |
| ***Exams/Attendance/Participation*** | ***% Value*** | ***Grade Scale*** |
| **Weekly 3-2-1s** | 10 | 90-100 =A |
| **Attendance/Participation** | 10 | 80-89 = B |
| **Project One** | 15 | 70-79 = C |
| **Project Two** | 25 | 60-69 = D |
| **Final Paper** | 30 | 0-59 = F |
| **Research Question and rough draft** | 10 |  |

***Course Policies and Information for Students***

1. ATTENDANCE POLICY

Your attendance to all of the classes will be required. If you must miss a class due to illness, family emergencies, or any other valid excuse, you must still complete the readings and turn in the missed 3-2-1 within the week of the class that was missed. Additionally, you should turn in a paragraph or two regarding your thoughts on the readings and how you might answer one or two of your questions presented on your 3-2-1.

2. PENALTIES FOR LATE WORK and REQUESTS FOR EXTENSIONS

Life happens, be in communication with the instructor in regards to any of the projects. All work will see a 10% reduction per day it is not turned in UNLESS more specifics are discussed in advance with the professor.

3. REGRADING POLICY

If you wish to be regraded for a major assignment, you must submit the request in writing within one week of when the assignment was handed back. Finals will not be considered for regrading.

4. TECHNOLOGY POLICIES:

Cell phones can be distracting to your fellow students and teachers and must be put away during class. Laptops may be necessary during certain classes for exercises however should not create a distraction if you so choose to take notes on it. If you are in need of a laptop for a class exercise, you can check one out at the library.

5. ETHICS/VIOLATIONS OF ACADEMIC INTEGRITY:

**Academic Integrity:** MSU expects all students to conduct themselves as responsible and honest members of the academic community, respecting the rights of other students, faculty members, staff and the public. For additional info, see <http://www.montana.edu/policy/student_conduct/#conductcode>

**Academic Misconduct:** Section 420 of the student Conduct code describes Academic Misconduct as including but not limited to plagiarism, cheating, multiple submissions, or facilitating others’ misconduct. According to Section 430 of the Student Code, the sanctions imposed by course instructors can range from an oral reprimand to a failing grade in the class. There will be a zero grade on the assignment in question, which generally leads to a failing course grade. For further info, see <http://www.montana.edu/policy/student_conduct/#academicmisconduct>

***Resources for Students***

1. DISABILITY RESOURCES: If you have a disability that requires an accommodation, please contact the Office of Disability Services(<http://www.montana.edu/aycss/disability/student.html>). The staff will determine appropriate accommodations and will work with the instructor to make sure these are available to you.

2. WRITING ASSISTANCE: For additional help on your writing, consult the expert staff of **The Writing Center** (<http://www.montana.edu/writingcenter/>). It can be very helpful to ask someone outside a course to read your essays and to provide feedback on strength of argument, clarity, organization, etc. For more assistance, feel free to email the TA for this course with questions. Be aware of time management and considerate of the 48-hour response time that may occur.

3. THE VOICE CENTER: In cases of sexual assault, relationship violence, or stalking, the VOICE center is located in SUB 370 on the third floor above Leigh Lounge and Avogadros. A safe, highly confidential place on campus that offers support, advocacy, and resources for those affected. With a 24-Hour Confidential Support Line (406-994-7069), walk in hours from 10-4 during the academic semester, and many services, this is a great resource on campus. See: <http://www.montana.edu/oha/voice/>

4. MENTAL HEALTH**:** Counseling & Psychological Services professional staff members work with students to resolve personal and interpersonal difficulties, many of which can affect the academic experience. These include conflicts with or worry about friends or family, concerns about eating or drinking patterns, and feelings of anxiety and depression. See: <http://www.montana.edu/counseling/>

***Disclaimer****: The instructor reserves the right to make modifications to this information throughout the semester.*

***Preliminary Schedule of Topics, Readings, and Assignments***

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| --- | --- | --- |
| **Date** | **Topics/Assigned Readings/Homework** | **Required Readings** |
| **Week One**  **8/27** | Course introduction    Exercise: The Evolution of Trust (30min play time, by Nicky Case) and helps explore how different algorithms act while exploring different variables | no readings |
| **Week Two**  **9/3** | Labor day  no classes |  |
| **Week Three**  **9/10** | **Topic: What is an algorithm?**    **Exercise:** Students write down their individual definitions of algorithms, get into small groups and come to a consensus, share with the class and turn in results | Seaver, Pariser |
| **Week Four**  **9/17** | Topic: Internet Culture and its change over time    Exercise: Students will talk about their own experiences growing up with the internet | Dijck, Pasquale |
| **Week Five**  **9/24** | Topic: The Makings of an Algorithm    Exercise: Ananny’s algorithmic walk/module one coding exercise | Haynes, Rieder |
| **Week Six**  **10/1** | In Class Presentations  FIRST PROJECT DUE | **No readings** |
| **Week Seven**  **10/8** | Topic: Bias in Search Results    Exercise: Students will use their laptops and google the same thing. See the different results and try to guess why these different things may have come up (are you an online gamer/shopper/researcher) | Reidsma, Noble |
| **Week Eight**  **10/15** | Topic: Algorithms as Authority    RESEARCH QUESTION DUE    Exercise: Student will get a copy of the ACRL frameworks and argue why or why not algorithmic awareness should fit into the category “authority is constructed and contextual”. | Ekstrom, Slavin |
| **Week Nine**  **10/22** | Topic: Metadata in Society  Exercise: | O’Neil |
| **Week Ten**  **10/29** | Topic: Algorithmic Accountability  Exercise: | Diakopoulos |
| **Week Eleven**  **11/5** | SECOND PROJECT DUE | **No readings** |
| **Week Twelve**  **11/12** | Veteran's Day, no classes |  |
| **Week Thirteen**  **11/19** | Topic: Anticipatory Design: Positives and Negatives    Exercise: In small groups, students will share their research questions and discuss what a potential outline for their final paper would be. Other group members will provide ideas and feedback | Clark |
| **Week Fourteen**  **11/26** | Topic: Culture and Computers  Exercise: | Bogost |
| **Week Fifteen**  **12/3** | ROUGH DRAFT RESEARCH PAPER DUE  Exercise: in class peer review of final |  |
| **Final Exam**  **12/10** | FINAL PAPER DUE |  |