University of Rhode Island

Department of Computer Science & Statistics
DSP/BIO 181G, The Information Age, Winter J-Term 2023

Indrani Mandal	E-mail: indrani_mandal@uri.edu
Office hour Meeting Link	TTR 11:00 -12:00 pm, or by appointment
Synchronous Meeting	Monday-Thursday
Class Meeting Link	12:00 - 2:30 pm
Asynchronous Online	Friday

Prerequisites: None

Course Description

Big data affects virtually every area of our society, from the advertising we see, to how we think about politics, to genome-based medicine. Our ability to collect immense amounts of information has the potential to improve many aspects of our lives, but it can also be misleading and biased. We will consider how data are analyzed and how results from those analyses are used to make policy in an increasingly data-driven world. You will also develop reasoning skills so that you can think critically about the data that is held up in today's society as providing answers to many questions. This course meets the General Education requirements for Grand Challenge and STEM Knowledge (A1) at URI.

Because this is a Grand Challenge course, it will require you to explore a wide range of subjects, all of which are affected by big data. You will learn to think across disciplinary boundaries, and hopefully you will interact with people with different experiences, majors, and interests. You might end up writing about how algorithms (traditionally the purview of the math or statistics or computer science departments) affect marketing (traditionally addressed in the business department), or how such algorithms might require ethical evaluation (where ethics traditionally falls under the department of philosophy).

Course Goals

In this course students will learn …

- the strengths and limitations of using data to understand the world
- different fields where big data is being gathered and used
- controversies surrounding the collection and use of data, and potential ethical implications
- how algorithms generate ideas from data
- to evaluate which data are appropriate for which questions
- to communicate the above goals in writing

Student Learning Outcomes

At the end of this course students should be able to…
- explain how data are produced and what makes data trustworthy and reliable
- appreciate how data can be used to enhance our understanding of our world and in decision-making
- critically evaluate the presentation and use of data by others
- understand when data and algorithms are used appropriately and ethically
- demonstrate that they have accomplished the above learning outcomes in a paper

Required Texts/Readings Textbook

1. Big Data: A Revolution That Will Transform How We Live, Work, and Think. Viktor Mayer-Schönberger and Kenneth Cukier. 2013. Houghton Mifflin Harcourt. (M&C in Readings list). Available on Kindle
2. Weapons of Math Destruction. Cathy O'Neil. 2016. Random House. Available on Kindle

Other Readings

Additional readings will be assigned as events occur and are reported in the news.

Other equipment / material requirements

You must have a working computer and access to the internet. You can come to the university libraries to access a computer if you don't have one.

- Requires G Suite applications: Google doc, Google Sheets, Google Slides, and Google Sheets.
- Requires Adobe Flash, and Adobe Acrobat Reader.
- Install Zoom to attend class.

Assignments and Grading Policy

For each assignment you will earn points. Your grade will be based on the percentage of total number of points you accumulate during the semester.

Grade	A	A-	B+	B	B-
Minimum %	94-100	90-93	87-89	83-86	80-82

Grade	C+	C	C-	D+	D
Minimum %	77-79	73-76	70-72	67-69	60-66

A grade less than 60% is considered an F (failing grade).

I will only give an Incomplete at the advice of the Department Chair or Disability Services for Students Office at 330 Memorial Union, 401-874-2098 (http://www.uri.edu/disability/dss/). If you are facing a difficulty, physical or circumstantial, please contact me and the Disability Services as soon as possible so that we can work something out together to help you complete the course.

Ways to earn points:

Activity	Points	Total Points
Class participation	10 points/ session (20 points/day)	240 *(one absence permitted)*
Short papers	100 points/ paper (1 paper per day)	500 *(grades from five best papers)*
Final paper	260	260

Total points for class	1000

Course mechanics

Monday-Thursday sessions will be synchronous online classes while Friday will be asynchronous. We will meet virtually via Zoom M-TR.

Two topics will be discussed every class session with a 10 minute break in between. Class participation is required for both topics discussed in class and are worth 10 points each.

Collaborative Work

The classroom activities will be performed in teams through short Zoom Breakout Sessions. For this reason, it is very important that you attend every class since the other members of your team are depending on your presence for the entire activity. While it is easy to get distracted while attending an online session, it is important that you stay focused during class and refrain from browsing the internet other than for class related activities.
Moreover, it is difficult to add a new team member part way through an activity. Because you are working in teams, your teammates are relying on you to join the class on time and to stay until the end of the period.

Class structure

Session 1	**Break**	**Session 2**
Topic 1	Reading	Topic 2
12:00-1:10 pm	1:10-1:20 pm	1:20-2:30 pm

Session structure

Location	Main room	Breakout room	Main room	Breakout room	Main room
Activity	Introduction	Breakout session 1	Discussion	Breakout session 2	Presentation
Time	10 mins	20 mins	5 mins	20 mins	15 mins

Expectations for class participation

Synchronous sessions

To earn full participation points during class students are expected to actively engage in small group discussions hosted in Zoom Breakout rooms. The class will start with a brief introduction followed by Breakout sessions. We will take a short break between two Breakout sessions for questions and clarifications.

The time in the Breakout sessions will be spent reading and participating in collaborative activities (shared Google slides). The Google slides will contain questions related to the assigned readings/videos. Students will collaborate with their team members to answer these questions and deliberate over the ethical issues related to the topic. Student collaboration will be made possible by sharing screens, collaborating over shared Google slides and sharing resources over chat in the Breakout rooms. Students are required to speak and participate in the discussion and presentation. While students are encouraged to have their video on, they are not required to.

The instructor will visit the breakout rooms every few minutes. If a student needs help sooner they can seek help by clicking on the 'Ask for Help' button in Zoom.

At the end of each session students will present their group work to the class. Special emphasis will be given to the ethical issues related to the topic.

Asynchronous sessions

Asynchronous readings and forum discussion will be allotted for Fridays. Discussion topics will be set up through the Discussion Forums in Brightspace. Students will read, analyze and post their responses in the Discussion Forum as part of their class participation. They will make an original post and will respond to at least two of their classmates' posts, thereby engaging in virtual discussion.

If a student fails to post the discussions on any given Friday, the student shall receive no credit for class participation. Homework will be assigned at the end of the class like any other day.

Expectations for short papers

- Each paper should be approximately 300 words.
- Each paper will be written in response to a prompt provided during Break/Reading time between 1:10 - 1:20 pm in Brightspace.
- The paper will be due by 11:59 pm every day.
- 12 prompts will be provided (1 per day except the last day).
- Each paper is worth 100 points.

- Students may write as many or as few papers as necessary to achieve a desired number of points up to 500 from 5 best papers.
- Writing should be grammatically correct and arguments should be well structured.
- Students should note sources of information, which may include the course texts, additional readings, or other material from a reputable source (check with the professor if you aren't sure). Examples for citations will be provided.
- Students should use the provided rubric to guide writing.

Expectations for final paper

Topic	Qualities
Argument	- Evidence, Examples and Sources - Papers should be approximately 1000 words. Expectations for the paper are as above; however, the final paper should synthesize materials covered in the course rather than addressing one topic. - The final paper is due at 11:59pm on the last day of classes for the term. - Specifics but not just anecdotes - Thesis statement / clear thesis - Awareness of different perspectives and viewpoints
Clarity	- Avoids jargon - Provides explanations - Easy to follow
Language	- Good grammar and spelling - No run-on sentences
Structure	- Each paragraph is organized - Paragraphs are organized across the paper - Has an introduction and conclusion - Transitions between paragraphs and sentences - Stays on topic - Appropriate for audience

Learning to write: During the first day of class we will discuss the expectations for writing in this course, including the grading rubric. For initial papers key points to address will be noted to aid in learning what is important to include in a paper. Throughout the course we will also discuss how assigned readings approach constructing well reasoned arguments. Because there are many assignments throughout the semester there is

significant opportunity to improve based on critique from both the professor and students in the course.

This course will require engagement with material, critical thinking, and the ability to write well-constructed arguments. The Academic Enhancement Center helps URI students succeed through three services: Academic Coaching, Subject-Based Tutoring, and The Writing Center.

Academic Enhancement Center: The Academic Enhancement Center (AEC) offers face-to-face and online services to undergraduate students seeking academic support **beginning Monday, January 31st, 2022**. Services are based out of Roosevelt Hall, the Carothers Library room LL004, and online. Peer tutoring is available for STEM-related courses through drop-in centers and small-group tutoring. The Writing Center peer consultants offer feedback focused on supporting undergraduate writers at any stage of a writing assignment. The UCS 160 course and one-to-one Academic Skills Consultations offer strategies for improving studying and test-taking skills. Complete details about each of these programs, up-to-date schedules, contact information, and self-service study resources are all available on the AEC website, uri.edu/aec.

- **STEM Tutoring** helps undergraduate students navigate a variety of 100 and 200 level STEM courses and a limited selection of BUS, STA, ECN, and CSC courses. The STEM Tutoring program offers free online and in-person peer tutoring. Students can select **occasional or weekly tutoring appointments** through the TutorTrac system or visit the Drop-In Center, located in the Carothers Library lower-level room LL004. The TutorTrac application is available through URI Microsoft 365 single sign-on and by visiting aec.uri.edu. More detailed information and instructions can be found at uri.edu/aec/tutoring.

- **The Undergraduate Writing Center** provides peer writing support to students in any class, at any stage of the writing process: from understanding an assignment and brainstorming ideas, to developing, organizing, and revising a draft. Spring 2022 consultations are available through: 1) 25- or 50-minute **in-person appointments**, 2) synchronous **online appointments**, and 3) asynchronous **next-day written feedback.** Synchronous appointments hosted by WC Online are video-based, with audio, chat, document-sharing, and live captioning capabilities, to meet a range of accessibility needs. View availability and book online at uri.mywconline.com. For more information, visit uri.edu/aec/writing.

Writing Tips

- Be concrete rather than abstract
- Use active verbs (exciting and not passive voice)
  - Eliminate forms of "to be" as much as possible (e.g. "be" "is", "was", "were", "are")
- Put human beings in rather than writing impersonally

- Use shorter sentences
- Use simpler and more compact words
- Omit needless words
- Include a conclusion
- (above advice from
  https://www.jamesgmartin.center/2013/05/teaching-college-students-to-write/)

The Hemingway App will correct grammar and writing errors. Use it!

Grammarly corrects a variety of errors. Use it!

University Course Policies

COVID Precautions Statement: The University is committed to delivering its educational mission while protecting the health and safety of our community. As members of the URI community, students are required to comply with standards of conduct and take precautions to keep themselves and others safe.

- **Universal classroom masking is required of all community members, on all campuses and in university vehicles, regardless of vaccination status.**
- We strongly recommend surgical or higher grade masks in all indoor campus spaces. Masks should be properly worn, well-fitting, and high quality.
- Students who do not comply with the indoor masking requirement will be asked to leave class and will be reported through the Student Conduct process.
- Students who are experiencing symptoms should NOT go to class/work until they have received a negative test; or if they test positive, after they have completed the required isolation period. Those who test positive for COVID-19 should follow updated isolation guidelines from the Rhode Island Department of Health and CDC. Please visit the Health Services website for the most up-to-date symptomatic testing schedule.

If you are unable to attend class, please notify me prior to the start of class at indrani_mandal@uri.edu or through the medium we have established for the class.

Anti-Bias Syllabus Statement: We respect the rights and dignity of each individual and group. We reject prejudice and intolerance, and we work to understand differences. We believe that equity and inclusion are critical components for campus community members to thrive. If you are a target or a witness of a bias incident, you are encouraged to submit a report to the URI Bias Response Team at www.uri.edu/brt. There you will also find people and resources to help.

Disability, Access, and Inclusion Services for Students Statement: Your access in this course is important. Please send me your Disability, Access, and Inclusion (DAI) accommodation letter early in the semester so that we have adequate time to discuss and arrange your approved academic accommodations. If you have not yet established

services through DAI, please contact them to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom. DAI can be reached by calling: 401-874-2098, visiting: web.uri.edu/disability, or emailing: dai@etal.uri.edu. We are available to meet with students enrolled in Kingston as well as Providence courses.

Video Capture - We will be using video capture in classrooms in order to make recordings available to students for review. There might be situations when the video captures images or voices of students AND these recordings are used in another class or for any other purpose. If you do not wish to be recorded in class please let me know ahead of time.

Academic Integrity - Understanding the culture of source management and attribution in academe is a process of learning and relearning, with increasing complexity over time. Our goal is to better distinguish between intentional plagiarism or cheating and making mistakes. URI's Student Handbook web.uri.edu/studentconduct/student-handbook/) provides guidelines concerning academic honesty in this regard. Additional assistance is available at the Writing Center and the Academic Enhancement Center. It may be useful to add a statement in your syllabi using the following language:

Students are expected to be honest in all academic work. A student's name on any written work, quiz or exam shall be regarded as assurance that the work is the result of the student's own independent thought and study. Work should be stated in the student's own words, properly attributed to its source. Students have an obligation to know how to quote,
paraphrase, summarize, cite and reference the work of others with integrity. The following are examples of academic dishonesty.

- *Using material, directly or paraphrasing, from published sources (print or electronic) without appropriate citation*
- *Claiming disproportionate credit for work not done independently*
- *Unauthorized possession or access to exams*
- *Unauthorized communication during exams*
- *Unauthorized use of another's work or preparing work for another student*
- *Taking an exam for another student*
- *Altering or attempting to alter grades*
- *The use of notes or electronic devices to gain an unauthorized advantage during exams*
- *Fabricating or falsifying facts, data or references*
- *Facilitating or aiding another's academic dishonesty*
- *Submitting the same paper for more than one course without prior approval from the instructors*

Students who engage in academic dishonesty should be reported through the Student Conduct process (see General Conduct Report).

Remote Classroom requirements

- Students should stay in front of their computers and be attentive for the entire duration of the class.
- Internet browsing, chatting through private messages, and running other applications during class is prohibited.
- Find a quiet place to take the class where you can hear the class lecture/discussion clearly..
- Be prepared to speak and participate in class discussions. Have a pair of headphones ready. If you do not own one, please let me know early on in the semester.
- Be prepared to present your screen and/or Google slides with other students for the purpose of collaborative work.
- Be prepared to present your screen and/or Google slides with the class for the purpose of presentation.
- The sessions will be partially recorded, if you do not wish to be recorded please mute yourself while the recording is in progress.
- You can communicate with the instructors through private chat to ask questions but you are not allowed to engage in private conversations with other students during class.

Late work

All assignments should be submitted on time. Recognizing, however, that unusual demands on time occasionally do occur, *each student is allowed to turn in one assignment late during the semester.* For that one assignment, a penalty of 5% per day is assessed; after one week, no credit is given.

Attendance

Attendance will be taken in the beginning of the class. Students are permitted one unexcused absence during the semester. As a courtesy to the instructor and fellow students, please join on time and stay for the entire class period.

Policy on Religious Observance: A complete list of religious holidays can be found at: http://www.interfaith-calendar.org/.

According to the *Policy on Religious Observance. No faculty or staff member, administrator or student shall be discriminated against because of religious beliefs or practices.* However, students are responsible for informing the instructors in advance that they will be missing class and they are responsible for making up any missed work.

Students who plan to be absent from classes or examinations for religious holy days that traditionally preclude secular activity (see 6.20.11 for how such information is made available) shall discuss this with the appropriate instructor(s) in advance of the holy day. The instructor(s) shall then make one of the following options available:

a. the same quiz, test, or examination to be administered either before or after the normally scheduled time;

b. a comparable alternative quiz, test, or examination to be administered either before or after the scheduled time;

c. an alternative weighting of the remaining evaluative components of the course which is mutually acceptable to the student and instructor(s).

Students who expect to be absent from classes or examinations for University sanctioned events shall discuss this with the appropriate instructor(s) at least one week in advance of the sanctioned event(s). The instructor(s) concerned shall then offer the student an alternative listed in section 8.51.11. For these purposes, University-sanctioned events shall be those events approved for class excuses by the Provost and Vice President for Academic Affairs, a Vice President, a Dean, or the Director of Intercollegiate Athletics. No event shall be regarded as University sanctioned until the Provost and Vice President for Academic Affairs has been notified. Disagreements over the validity of an event being categorized as University sanctioned shall be mediated by the Provost and Vice President for Academic Affairs. If agreement cannot be reached, the Provost and Vice President for Academic Affairs shall decide the matter and that decision shall be final.

Course Schedule

Day	Date	Topics, Deadlines	Readings	Assignments
1	01/02	Course intro: syllabus and writing rubrics		
	Synch	What is Big Data and why do we collect it?	M&C Ch 1: Now	1
2	01/03	Ethical issues in big data	O'Neill Ch 10: The Targeted Citizen: Civic Life	
	Synch	Government data collection: the census		2
3	01/04	Using government data: gerrymandering		
	Synch	Government data use: crime and policing	O'Neill Ch 5: Civilian Casualties: Justice in the Age of Big Data	3
4	01/05	Political polls		

	Synch	Advertising	O'Neill Ch 4: Propaganda Machine: Online Advertising	4
5	01/06	Advertising	M&C Ch 4: Correlation	
	Online	The parable of Google Flu		5
6	01/9	Healthcare		
	Sunch	Medical Data	O'Neill Ch 8: Collateral Damage: Landing Credit	6
7	01/10	Medical image data		
	Synch	Medical Data	O'Neill Ch 9: No Safe Zone: Getting Insurance	7
8	01/11	Genome Sequencing		
	Synch	Using genomic data		8
9	01/12	Biodiversity	M&C Ch 3: Messy	
	Synch	Biodiversity		9
10	01/13 Online			Final Report
	01/16	Martin Luther King Day- No class		
11	01/17	Sprots		
	Synch	Sports		10
12	01/18	Business	O'Neill Ch 7: Sweating Bullets: On the Job	
	Synch	Business		11
12	01/19	Transportation	O'Neill Introduction	

	Synch	Transportation	O'Neill Introduction	12
13	01/20 Online	Final Report		