

Course Description

What is a fair election? What kinds of elections favor centrist, consensus building candidates, from a game theoretic point of view? What is the best way for a politician to persuade while still being truthful?

Democracy, Game Theory, and Persuasion explores these questions from both quantitative and qualitative perspectives. In this class, Dr. Bray uses game theory to discuss the meaning of democracy. The course examines the pros and cons of different approaches to voting, such as preferential ballot elections and Ranked Pairs Voting, and introduces game theory as an essential tool for predicting political behavior. At the same time, Dr. Giugni will introduce the class to the central literature and theories of political persuasion in the face of disagreement. We will focus on which rhetorical strategies have been embraced or viewed with suspicion by theorists, from Plato to Hobbes, as well as adopted in imaginative literature, from Shakespeare's *Julius Caesar* to Walter Miller's sci-fi classic *A Canticle for Leibowitz*. This course will ask you to think carefully about the practical and theoretical preconditions for life in a democracy.

Books (on order at the bookstore)

Required:

- Aristotle, *Rhetoric and Poetics*, Modern Library, ISBN 0075546027
- Plato, *Gorgias*, Oxford, ISBN 9780199540327
- Rousseau, *Social Contract*, Cambridge, ISBN 0521424461
- Shakespeare, *Julius Caesar*, Arden, ISBN 9781903436219
- Walter M. Miller, *A Canticle for Leibowitz*, Bantam Spectra, ASIN: B01N3MEKRI

Note: Used (and inexpensive) versions of these texts should be easy to find online or through the bookstore. You **must** use the editions indicated above.

Office hours

Regular office hours:

- **Dr. Giugni:** Thursdays, 12:30-2:30pm (Perk coffee shop on West). My office hours will start on Thu, January 24th (I am happy to meet before then by appointment). **Note:** If you can't make these office hours, I am available to meet by appointment. My schedule fills up quickly, so schedule an appointment well ahead of time (hint: *at least 3 days in advance*)!
- **Dr. Bray:** Tuesdays, 11:30 to 1:30, in my office, Physics 189. This is right after class, so if a group wants to go to lunch together, we can do that too. Let me know if you are coming to office hours beforehand, so I can make sure I don't miss you.

Requirements and Policies

- Attendance and Class Participation: attendance is required as well as active participation during class discussions.
- Readings (both primary and secondary) **must** be completed on the day assigned. The texts assigned in this class will require careful and attentive reading. Plan your work ahead of time and leave plenty of time to read and reread each text.
- Videos on the mathematics portion of the class will also be assigned before some classes, with quizzes to follow in class after each video. Those who do not carefully watch the videos will not pass the quizzes. Videos for this class are posted at <https://warpwire.duke.edu/w/Qh4CAA/>. Note that the videos are in random order - my apologies - so you may have to search the list to find the video you need. Take notes! You will be allowed to use your notes during your quizzes on these videos in class.

Grades:

- Reading responses and Twitter Exercise (3 assignments): **5%** of the grade total.
- The **paper on *Julius Caesar*** is worth **20%** of the grade. **Due:** February 12th.
- The **second paper** is worth **25%** of the grade. **Due:** April 4rd.
- Math Homework and quizzes on the videos will count for **25%** of the grade.
- An **exam on the math portion** of the course will count for **25%** of the grade.

☠ **Integrity:** Academic writing is seldom self-contained with respect to its ideas and proof. Quoting and citing sources strengthens your writing by explicitly situating your argument within an ongoing conversation and body of evidence. **All cases of academic dishonesty will result in automatic failure of the course.** Please ask me if you have any questions about what constitutes plagiarism. You may also consult: <http://library.duke.edu/research/plagiarism>.

☠ **Disruptive and distracting class behavior:** please remember that you are sharing the classroom with other students, so avoid behavior that could be distracting to others, such as having your cell phone on, arriving late or leaving early (unless absolutely necessary and cleared with the instructor), engaging in side conversations, etc.

☠ **No laptop or tablet or smart-phone or Apple Watch or... use allowed during class time,** unless required for an activity. **Note:** this means that you will need print editions of the readings.

- **Please Note:** We are usually easily reachable via email, but **don't** assume that we will be able to answer a last-minute email before a deadline! Email to us and to the other class members should be considered a form of professional communication: be polite and professional!
- We will **not** email you your grade or discuss grades over email (these are both violations of privacy!).

SYLLABUS

Please note that this schedule may change over the course of the semester. If it changes, we will post any updates on Sakai and announce them in class.

Week 1: Introduction to the class

- **Thursday, January 10**— Please read Federalist No. LXIII (<https://oll.libertyfund.org/titles/hamilton-the-works-of-alexander-hamilton-federal-edition-vol-12/simple>). This is about 5 pages long and you only need to give it a quick read to familiarize yourself with the content.

Week 2:

- **Tuesday, January 15**— Watch these videos:

- 1.01 [Types of Ballots in Elections](#)
- 1.02 [Who Wins a Preferential Ballot Election](#)
- 1.03 [Plurality and Instant Runoff Voting](#)
- 1.04 [The Unit Interval Model](#)
- 1.05 [Instant Runoff Voting is NOT Monotone](#)

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Take notes! You will be allowed to use your notes during your quizzes on these videos in class.

- **Thursday, January 17**— Watch these videos:

- 1.06 [The Margin of Victory Matrix](#)
- 1.07 [The Borda Count](#)
- 1.08 [The Borda Count is NOT Clone Invariant](#)
- 1.09 [The Borda Count and Nuclear War](#)
- 1.10 [Instant Runoff Borda is Condorcet](#)
- 1.11 [Instant Runoff Borda and the Unit Interval Model](#)

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Week 3: What is wrong with rhetoric? Plato's *Gorgias*

- **Tuesday, January 22:** *Gorgias*
- **Thursday, January 24:** *Gorgias* and selections from Aristotle

Week 4: Persuading the public—Shakespeare's *Julius Caesar*; **Reading Response 1 due**

- **Tuesday, January 29:** *Julius Caesar*—Reading response on *Gorgias* due
- **Thursday, January 31:** *Julius Caesar*

Week 5: Free speech and free press—Milton's *Aeropagitica*

- **Tuesday, February 5:** *Aeropagitica* and selections from Aristotle
- **Thursday, February 7:** *Aeropagitica* and selections from Aristotle

Week 6: **Paper on JC due**—On Tuesday (02/12), we will meet in Rubenstein Library

- **Tuesday, February 12:** Library Room 349—Special collections visit. **First paper (on *Julius Caesar*) due.**
- **Thursday, February 14:** Watch these videos:

- 1.12 [The Game Theory of Condorcet Methods](#)
- 1.13 [Worst Defeat](#)
- 1.14 [The Schulze Method](#)
- 1.15 [Ranked Pairs](#)
- 1.16 [Comparison of Vote Counting Methods that use the Margin of Victory Matrix](#)
- 1.17 [What is Democracy?](#)

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Week 7: **Ice cream flavor survey due** (emailed to Dr. Bray)

- **Tuesday, February 19:** As described in class, survey 15 people on a question with 15 choices, such as "What is your favorite flavor of ice cream?" Print out 16 ballots, with instructions, which people can fill out by putting a 1 by their first choice, a 2 by their second choice, etc., and a 15 by their 15th choice. Fill out a 16th ballot yourself which you will designate the tie breaking ballot. Then go to www.wevotehere.org, click on "Create an Election" and then "Spreadsheet Election" and then follow the instructions. The web page will think for a few minutes and then return a spreadsheet which you can download which tells you which choice won the election, the ranking of all of the choices, as well as many other things about the election.

Turn in THREE things to Dr. Bray by email, by class on Tuesday: The ballot you created, the spreadsheet produced by the web page, as well as a 1 page summary that you write which includes the question, the 15 choices (in order that they were ranked), and what you found interesting about the results. Put "GTD" in your email subject headline (stands for Game Theory and Democracy) so that I know this is homework you are turning in. Be prepared to discuss your survey in class - I will call on random students.

Also, use this format for the files you turn in by email:

XYZ_Ice Cream Survey_Ballot.docx (or .pdf, or whatever)
XYZ_Ice Cream Survey_Computer Results.xlsx
XYZ_Ice Cream Survey_Summary.docx (or .pdf, or whatever)

where XYZ represent your initials and you put the title of you survey where it says "Ice Cream Survey."

- **Thursday, February 21:** Watch these videos:

2.01 [Balancing Risk and Reward in Investments](#)
2.02 [The Kelly Criterion: Quadruple or Nothing](#)
2.03 [The Gambler's Ruin](#)

Videos for this class are posted at <https://warppwire.duke.edu/w/Qh4CAA/>. Note that the videos are in random order - my apologies - so you may have to search the list to find the video you need.

Take notes! You will be allowed to use your notes during your quizzes on these videos in class.

Week 8: **Second Survey due** (emailed to Dr. Bray)

- **Tuesday, February 26:** As described in class, survey two different groups of 15 people on a question with 15 choices. The goal will be to see if the two groups have different opinions

on your question and, if so, what those differences are. Discuss whatever you found interesting about the two surveys in one joint summary document. Did you find a Condorcet choice in each survey? Were there cycles in people's preferences? What surprised you or did not surprise you?

Turn in FOUR things to me by email, by class on Thursday: The ballot you created, the 2 spreadsheets produced by the web page for each of the 2 surveys, as well as a 1 page summary that you write which includes the question, the 15 choices (in order that they were ranked), and what you found interesting about the results. Put "GTD" in your email subject headline (stands for Game Theory and Democracy) so that I know this is homework you are turning in. Be prepared to discuss your surveys in class - I will call on random students.

Also, use this format for the files you turn in by email:

XYZ_Ice Cream Survey_Ballot.docx (or .pdf, or whatever)
XYZ_Ice Cream Survey_Computer Results for Group 1.xlsx
XYZ_Ice Cream Survey_Computer Results for Group 2.xlsx
XYZ_Ice Cream Survey_Summary.docx (or .pdf, or whatever)

where XYZ represent your initials and you put the title of you survey where it says "Ice Cream Survey."

➤ **Thursday, February 28:** Watch these videos:

2.04 [Kelly Criterion - Balancing Risk and Reward](#)
4.01 [Intro to General Relativity](#)
4.02 [The Geometry of Black Holes](#)

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Take notes! You will be allowed to use your notes during your quizzes on these videos in class.

Week 9: Political deliberation and political factions—Rousseau

- **Tuesday, March 5:** *Social Contract*
- **Thursday, March 7:** *Social Contract*

SPRING BREAK

Week 10: Rousseau cont'd and 2018 Florida Recount on Twitter; **Reading response on *Rousseau***

- **Tuesday, March 19:** *Social Contract*. Reading response on *Rousseau* due. Introduction to Emma Davenport and Twitter analysis
- **Thursday, March 21:** Twitter

Week 11: 2018 Florida Recount on Twitter; **Twitter Assignment Due**

- **Tuesday, March 26:** Twitter
- **Thursday, March 28:** Twitter—**Assignment Due**

Week 12: Political Persuasion in the nuclear apocalypse; **Paper Two due**

- **Tuesday, April 2:** *A Canticle for Leibowitz*
- **Thursday, April 4:** *A Canticle for Leibowitz*. **Paper Two due**

Week 13: **Game theory problems and exercises due**

- **Tuesday, April 9:** All of the problems and exercises from Prof. Bray's book "Democracy versus Game Theory" (supplied to you for free by email) are due.
- **Thursday, April 11:** Game Theory

Week 14

- **Tuesday, April 14:** Game Theory
- **Thursday, April 18:** Game Theory

Week 15

- **Tuesday, April 23:** Comprehensive Math Exam