

## PHPE 400 - Individual and Group Decision Making

Instructor:	Eric Pacuit (pacuit.org)
Semester:	Fall 2023
Email:	epacuit@umd.edu
Course Website:	<a href="https://umd.instructure.com/courses/1352001">https://umd.instructure.com/courses/1352001</a>
Class Times:	MW 12:00pm - 12:50pm
Location:	TWS 1100
Office Hours:	Mondays, 1:30pm - 2:45pm
Office:	Skinner 1103A

### Course Description

This course introduces students to the basic concepts and techniques used in philosophical and economic analyses of individual and group decision making. The course is focused on individual decisions (decision theory), strategic decisions (game theory) and group decisions (social choice theory). Students will discuss the main foundational issues that arise when studying mathematical models of individual and group decision making, and explore key applications of these mathematical models in philosophy, politics and economics. Readings will be drawn from the literature in economics, philosophy, political science, psychology, and statistics. Topics include ordinal and cardinal utility theory (including the von Neumann-Morgenstern Representation Theorem), the Allais paradox, the Ellsberg paradox, a brief introduction to game theory and the Prisoner's dilemma, voting methods, voting paradoxes, May's Theorem, Arrow's Theorem, judgement aggregation, the Condorcet Jury Theorem, and aggregating utilities. Time permitting, we will also discuss Newcomb's paradox, strategic voting, Sen's impossibility of the Paretian liberal, and gerrymandering.

### Philosophy, Politics and Economics Major

This is a required course in the new Philosophy, Politics and Economics major. For more information about the PPE major, consult the program website or contact Dan Moller (dmoller@umd.edu).

### Course Objectives

The main objective is to train students in the formal thinking and reasoning used in the interdisciplinary research area Philosophy, Politics and Economics. After successfully completing this course you will be able to:

1. critically examine mathematical models of individual and group decision making.
2. explain the assumptions behind key theorems about individual and group decision making, such as the von Neumann Morgenstern representation theorem, May's theorem, Arrow's impossibility theorem, and the Condorcet jury theorem.
3. compare and contrast different methods for making group decisions.

4. use rational choice models of individual and group decision making to study problems in philosophy, politics and economics.

## Required Resources

- Course Website: <https://umd.instructure.com/courses/1352001>
- Tophat Account: <https://app.tophat.com/e/384276>. *You must purchase a Tophat pro account.* The join code is **384276**.
- This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from both me and your classmates. Rather than emailing questions to me, I encourage you to post your questions on Piazza.
- Readings: There is no textbook to purchase for this course. The course will be based on readings from various textbooks are journal articles. The relevant material will be made available on the course website. Many of the readings will be chapters from the following textbooks:
  - G. Gaus and J. Thrasher, *Philosophy, Politics, and Economics: An Introduction*, Princeton University Press, 2021.
  - Daniel Hausman, *Preference, Value, Choice and Welfare*, Cambridge University Press, 2012.
  - Martin Peterson, *An Introduction to Decision Theory*, 2nd Edition, Cambridge University Press, 2017.
  - Julian Reiss, *Philosophy of Economics: A Contemporary Introduction*, Routledge, 2013.
  - Daniel Hausman, Michael McPheerson, and Debra Satz, *Economic Analysis, Moral Philosophy, and Public Policy*, Cambridge University Press, 2017.

In addition, there are online notes (<https://notes.phpe400.info>) covering some of the material discussed in the course.

## Course Structure

This course will have weekly lectures on Mondays and Wednesdays 12:00pm - 12:50pm. During the lectures, we will introduce the material for the week, discuss the readings, and work together on participation questions. Every Friday, students must attend a discussion section. The discussion section will offer additional opportunities to practice the material presented in class, and answer any questions about the problem sets.

## Grading Policy

The course requirements are:

- **Participation:** There will be weekly “participation questions” assigned via Tophat (<https://app.tophat.com/e/384276>). Almost all the questions will be asked and answered during the lectures or sections. Some questions will be graded for participation only (i.e., you get

full credit as long as you answer the question before the deadline) and other questions will be graded for correctness (i.e., you get 0.5 points for participation and 0.5 points for correctness). *You are encouraged to discuss these problems with your classmates.* You will be given a chance to correct any mistakes on the participation questions answered during lectures or the discussion section. The deadline for correcting participation questions are as follows:

- All participation questions for weeks 1 - 7 must be completed before TBA.
- All participation questions for weeks 10 - 16 must be completed before TBA.

- **Problem Sets:** There will be 10-12 problem sets. Problem sets will be submitted through Gradescope (accessible through the course website). You can use your notes, the readings, and the online textbook, but you should not discuss your answers with your classmates or use any AI tools, such as ChatGPT, to answer these questions.

Problem sets are **due Fridays at 11pm**. The penalty for late problem sets is as follows:

1. Problem sets submitted less than 24 hours after the due date (so, before Saturday at 11pm): no late penalty.
2. Problem sets submitted after Saturday at 11pm and *before class on Monday*: assignments will be graded, and a small late penalty may be applied (1% - 10% of the total number of points may be deducted).
3. Problem sets submitted after class on Monday (without a valid excuse): the problem set will be lightly graded, and you will receive at most 1/2 the total points for the assignment.

- **Exams:** There will be 2 exams given during the semester:
  - **Midterm:** Rational Choice and Game Theory (the online portion of the midterm exam is tentatively scheduled for Wednesday, )
  - **Final Exam:** The final will be cumulative (though more emphasis on material after the midterm exam) and given during finals week. Consult <https://app.testudo.umd.edu/soc/exam/> for more information about the time and location of the final exam.

Grades will be assigned according to the following weights:

Participation	30%
Problem Sets	40%
Midterm	15%
Final Exam	15%

Your final grade may be curved, but the final grade cutoffs are typically as follows:

A+ > 100%	B+ 88%	C+ 78%	D+ 68%	F < 60%
A 93%	B 83%	C 73%	D 63%	
A- 90%	B- 80%	C- 70%	D- 60%	

See undergraduate catalogue for description of grades, e.g., A+, A, A-, etc.: <https://registrar.umd.edu/current/Policies/acadregs.html#plusminus>.

## Tentative Syllabus

Below is a tentative syllabus for this semester. This is subject to change. Please consult the course website for an up-to-date overview of the material discussed in the course.

Date	Topic
8/28 8/30	Introduction and motivation, Rational preferences
9/4	<b>No class - Labor Day</b>
9/6	Utility
9/11 9/13	Expected utility theory
9/18 9/20	Paradoxes of decision theory
9/25 9/27	Introduction to game theory
10/2 10/4	Nash equilibrium, Prisoner's dilemma and related games
10/9	Review: ( <b>Online lecture - Away at a conference</b> )
10/11	Midterm Exam ( <b>Away at a conference</b> )
10/16 10/18	Introduction to voting theory
10/23 10/25	Voting paradoxes
10/30 11/1	Justifying majority rule: May's Theorem
11/6 11/8	Arrow's Theorem
11/13 11/15	The Condorcet Jury Theorem and paradoxes of judgement aggregation
11/20	Evaluative voting
11/22	<b>No class - Thanksgiving break</b>
11/27 11/29	Aggregating utilities
12/4 12/6	Topics (e.g., utilitarianism, strategic voting, ...)
12/11	Review

### Part 1: Individual Decision Making

- Preferences, Utility and Choices

Reading:

- \* D. Hausmann, *Preference, Value, Choice and Welfare*, Ch. 1: Preferences, Comparative Evaluation and Reasons and Ch. 2: Preference Axioms and their Implications

- \* J. Reiss, *Philosophy of Economics*, Chapter 3: Rational-Choice Theory
- \* EP, Notes on rational choice theory

Additional reading:

- \* G. Gaus and J. Thrasher, *Philosophy, Politics and Economics: An Introduction*, Chapter 2: Ordinal Utility Theory.
- \* I. Gilboa, *Rational Choice*, Chapter 2: Utility Maximization.

- Expected Utility and Cardinal Utility

Reading:

- \* J. Reiss, *Philosophy of Economics*, Chapter 3: Rational-Choice Theory
- \* EP, Notes on rational choice theory

Additional reading:

- \* J. Broome, "Utility", *Economics & Philosophy*, 7:1, 1991, pp. 1 - 12.
- \* G. Gaus and J. Thrasher, *Philosophy, Politics and Economics: An Introduction*, Chapter 3: Cardinal Utility.
- \* M. Peterson, *An Introduction to Decision Theory*, Chapter 5: Utility.

- Objections to the Standard Model of Rational Choice

Reading:

- \* J. Reiss, *Philosophy of Economics*, Chapter 3: Rational-Choice Theory, pp. 45 - 53
- \* M. Peterson, *An Introduction to Decision Theory*, Chapter 4: Decisions Under Risk, pp. 80 - 96.

Additional Reading:

- \* R. Briggs, Normative Theories of Rational Choice: Expected Utility, *Stanford Encyclopedia of Philosophy*  
<https://plato.stanford.edu/entries/rationality-normative-utility/>
- \* A. Sen (1977), Rational Fools: A Critique of the Behavioral Foundations of Economic Theory, *Philosophy & Public Affairs*, 6(4), pp. 317-344

- Brief Introduction to Game Theory and the Prisoner's Dilemma

Reading:

- \* G. Gaus and J. Thrasher, *Philosophy, Politics and Economics: An Introduction*, Chapter 5: Foundations of Game Theory.
- \* J. Reiss, *Philosophy of Economics*, Chapter 4: Game Theory, pp. 63 - 81

Additional reading:

- \* M. Peterson (ed.), *The Prisoner's Dilemma*, Chapter 2: Why all the fuss? The many aspects of the Prisoner's Dilemma by K. Binmore
- \* M. Peterson (ed.), *The Prisoner's Dilemma*, Chapter 3: Taking the Prisoner's Dilemma seriously: what can we learn from a trivial game? by D. Hausman
- \* M. Peterson (ed.), *The Prisoner's Dilemma*, Chapter 4: Prisoner's Dilemma doesn't explain much by R. Northcott and A. Alexandrova

- Additional Topics (time permitting)
  - Newcomb’s Paradox, evidential and causal decision theory
  - Inter-temporal Choice, Debates about Backward Induction, and the Absent-Minded Drivers Problem

## Part 2: Group Decision Making

- Voting and Social Choice

Reading:

- \* EP, Voting Methods ([plato.stanford.edu/entries/voting-methods/](http://plato.stanford.edu/entries/voting-methods/)) Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2019.
- \* Christian List, Social Choice Theory ([plato.stanford.edu/archives/win2013/entries/social-choice/](http://plato.stanford.edu/archives/win2013/entries/social-choice/)), Section 1, The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2013.

Additional reading:

- \* G. Gaus and J. Thrasher, *Philosophy, Politics and Economics: An Introduction*, Chapter 8: Social Choice Theory.

- May’s Theorem and Arrow’s Theorem

Reading:

- \* EP, Notes on the proof of May’s Theorem
- \* Christian List, Social Choice Theory ([plato.stanford.edu/archives/win2013/entries/social-choice/](http://plato.stanford.edu/archives/win2013/entries/social-choice/)), Section 2, The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2013.
- \* Michael Morreau, Arrow’s Theorem ([plato.stanford.edu/entries/arrows-theorem/](http://plato.stanford.edu/entries/arrows-theorem/)), Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2014.

- Social Choice Theory and Democracy - Implications of the Theorems

Reading:

- \* J. Patty and E. Penn, *Social Choice and Legitimacy: The Possibilities of Impossibility*, Chapter 2: The Debates Surrounding Social Choice pp. 26 - 35
- \* G. Mackie (2006), The Reception of Social Choice Theory by Democratic Theory

- Judgement Aggregation

Reading:

- \* Christian List, Social Choice Theory ([plato.stanford.edu/archives/win2013/entries/social-choice/](http://plato.stanford.edu/archives/win2013/entries/social-choice/)), Section 5 Judgment aggregation, The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2013.

- The Condorcet Jury Theorem and Wisdom of the Crowd

Reading:

- \* F. Dietrich (2008), The Premises of Condorcet's Jury Theorem Are Not Simultaneously Justified, *Episteme*, 5(1), pp. 56-73
- \* Christian List, Social Choice Theory ([plato.stanford.edu/archives/win2013/entries/social-choice/](http://plato.stanford.edu/archives/win2013/entries/social-choice/)), Section 5 Judgment aggregation, *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), 2013.

- Interpersonal Comparison of Utilities

Reading:

- \* M. Resnik, *Choices: An Introduction to Decision Theory*, Section 6-4: Utilitarianism
- \* D. Hausman (1995), The Impossibility of Interpersonal Utility Comparisons, *Mind*, 104(415), pp. 473-490

Additional reading:

- \* M. Peterson, *An Introduction to Decision Theory*, Section 13.4: Harsanyi's Utilitarian Theorems, pp. 301 - 307

- Additional topics (time permitting)

- Evaluative Voting - Approval Voting, Score Voting, Majority Judgement
- Strategic Voting (Gibbard-Satterthwaite Theorem)
- Sen's Impossibility of Paretian Liberal
- Gerrymandering
- Deliberation and social choice
- Topics in computational social choice: Liquid democracy, Participatory budgeting

## Course Policies

A full list of course-related policies and relevant links to resources may be found at:

<http://www.ugst.umd.edu/courserelatedpolicies.html>.

**Communication about this Course** I will use ELMS announcements and Piazza ([https://umd.instructure.com/courses/1352001/external\\_tools/42711](https://umd.instructure.com/courses/1352001/external_tools/42711)) to convey important information, and students are responsible for keeping their email address up to date, and must ensure that forwarding to another email address functions properly. Failure to check email, errors in forwarding, and returned email are the responsibility of the student, and do not constitute an excuse for missing announcements or deadlines.

**Names/Pronouns and Self-Identifications** The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit [trans.umd.edu](http://trans.umd.edu) to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

**Accessibility and Disability Services** The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The Accessibility & Disability Service (ADS) (<https://www.counseling.umd.edu/ads/>) provides reasonable accommodations to qualified individuals to provide equal access to services, programs and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at [adsfrontdesk@umd.edu](mailto:adsfrontdesk@umd.edu).

### **Student Resources and Services**

- Note taking assistance (<https://counseling.umd.edu/ads/notetakers>)
- Counseling Center (<https://www.counseling.umd.edu/>)
- UMD's Student Academic Support Services website (<http://tutoring.umd.edu/>)
- UMD's Writing Center (<http://www.english.umd.edu/academics/writingcenter/schedule>)
- UMD's Student Resources and Services website (<https://sph.umd.edu/content/student-resources-and-services>)
- Basic Needs Security (<https://studentaffairs.umd.edu/basic-needs-security>)

**Class Cancellations** The University may be closed in the event of an emergency, in which case class will be cancelled. To find out if the University is closed you can check its main site (<http://www.umd.edu>), its emergency preparedness site (<http://www.umd.edu/emergencypreparedness/>), or call the “snow phone line” at 301-405-7669 (which covers more than just snow caused closings). If class is cancelled while the University remains open, then there will be an announcement posted on the course ELMS page.

**Emergency Protocol:** In the case of an extended closure to the University (e.g., because of inclement weather), consult the ELMS course page for announcements and changes to any due dates.



**Attendance and Absences** Students are expected to attend classes regularly. Consistent attendance offers students the most effective opportunity to gain command of course concepts and materials. Events that justify an excused absence include: religious observances; mandatory military obligation; illness of the student or illness of an immediate family member; participation in university activities at the request of university authorities; and compelling circumstances beyond the student's control (e.g., death in the family, required court appearance). Absences stemming from work duties other than military obligation (e.g., unexpected changes in shift assignments) and traffic/transit problems do not typically qualify for excused absence. Students claiming an excused absence must notify the course instructor in a timely manner and provide appropriate documentation. The notification should be provided either prior to the absence or as soon afterwards as possible. In the case of religious observances, athletic events, and planned absences known at the beginning of the semester, the student must inform the instructor during the schedule adjustment period. All other absences must be reported as soon as is practical. The student must provide appropriate documentation of the absence. The documentation must be provided in writing to the instructor by the means specified in this syllabus. The full university attendance/absence policy can be found here: <http://www.ugst.umd.edu/courserelatedpolicies.html>.

**Academic Integrity** The UMD Honor Code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents and forging signatures. On every examination, paper or other academic exercise not exempted by the instructor, students must write by hand and sign the following pledge:

*I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment).*

Allegations of academic dishonesty will be reported directly to the Student Honor Council: <https://studentconduct.umd.edu/>

**Copyright Notice** Class lectures and other materials are copyrighted. They are the property of the instructor - do not sell them, do not post them on a website. They may not be reproduced for anything other than personal use without written permission from the instructor. Copyright infringements may be referred to the Office of Student Conduct.

**Academic Accommodations for Students who Experience Sexual Misconduct** The University of Maryland is committed to providing support and resources, including academic accommodations, for students who experience sexual or relationship violence as defined by the University's Sexual Misconduct Policy. To report an incident and/or obtain an academic accommodation, contact the Office of Civil Rights and Sexual Misconduct at 301-405-1142. If you wish to speak confidentially, contact Campus Advocates Respond and Educate (CARE) to Stop Violence at 301-741-3555. As 'responsible university employees' faculty are required to report any disclosure of sexual misconduct, i.e., they may not hold such disclosures in confidence. For more information: <http://www.umd.edu/ocrsm/>

**Diversity** The University of Maryland values the diversity of its student body. Along with the University, I am committed to providing a classroom atmosphere that encourages the equitable

participation of all students regardless of age, disability, ethnicity, gender, national origin, race, religion, or sexual orientation. Potential devaluation of students in the classroom that can occur by reference to demeaning stereotypes of any group and/or overlooking the contributions of a particular group to the topic under discussion is inappropriate.

For information on elms, counseling, health, learning workshops, tutoring, writing help, student rights in undergrad courses, questions about graduation or add/drop/withdraw, please see <http://www.ugst.umd.edu/courserelatedpolicies.html>.