Chapman University
Department of Philosophy

PHIL 306—Games and Decisions

Interterm 2019   MTWR   1:00 – 3:45pm   Beckman 213

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Office Hours: Rm. 130 Becket Building (303 W. Palm Ave.)
                T, R   12 – 1pm, and by appointment

1. Overview

GE Area(s)
7QI – Quantitative Inquiry

Prerequisite(s)
Either a philosophy course, an upper division course in math or economics, or instructor's permission.

Description

Decision theory and game theory are formal apparatuses for analyzing preferences and choices. Students will learn the basics of the formal theories and then examine their foundations and philosophical implications. Some attention will also be paid to psychological research into how people actually make decisions, as well as how we make collective decisions, and, where possible, we will make use of group projects, in-class experiments, and other activities that will help to shed light on the course's subject matter. (3 credits)

Course Objectives / Learning Outcomes

1. To acquaint students with the formal apparatus of decision theory, game theory, and social choice theory.
2. To acquaint students with philosophical problems and issues arising from these theories.
3. To introduce students to philosophical methods of argument and analysis.
4. PLO Critical Reasoning: To improve the student's ability to construct and analyze complex arguments, and distinguish good reasoning from bad.
5. PLO Logic: To improve the student's ability to demonstrate knowledge about and skill in deductive or inductive reasoning.
6. PLO Metaphysics & Epistemology: To acquaint students with some of the most important figures and theories in metaphysics and epistemology.
7. Quantitative GE: To apply and analyze quantitative methods and techniques.

2. Course Logistics and Materials

Course Schedule and Topics
Roughly speaking the semester will be broken into three parts. The first part will focus on Decision Theory, the second part on Game Theory, and the third part on Social Choice Theory. Respectively, these

are the theories of individual choice, strategic choice, and collective choice. During each part of the course we will discuss the importance of the respective theories and as well as some paradoxes and puzzles that raise some difficulties for them. Topics to be covered include:

- ordinal vs. cardinal utilities
- decisions under risk vs. under uncertainty
- static vs. dynamic problems
- positive vs. zero sum games

- the difficulty of cooperation
- achieving fair outcomes
- different voting rules
- how to make collective decisions
- the psychology of decision making

The course will primarily be based on lectures that will be presented in class (with slides to be posted to blackboard at the end of class).

Most lectures will also correspond to chapters in the recommended texts. These overlaps will be indicated on the first slide of each lecture. The Course Schedule (posted on Blackboard) will be regularly updated with a list of topics covered and to be covered (as well as the lecture notes associated with them). Problem sets will often be assigned in class and/or posted to blackboard after class.

Finally, note that the recommended texts for the course are designed to supplement our lectures. You will only be tested on material presented in lectures, but you are encouraged to make use of the recommended texts. This is because the texts are often able to go into more detail or provide more examples than we are able to in class. One thing this means is that the texts contain some sophisticated math. Don't let that scare you off. The main use of the texts will be for the nice examples they contain (although if you can work through the math your understanding of things will be that much better)!

Computers
You are permitted to use computers or tablets in class to take notes or read digital texts. However, I ask you to respect your classmates and refrain from surfing the internet, watching videos, or doing other things that might prove distracting to those sitting around you. If at any point the use of computers becomes disruptive to the class or impedes our ability to have good discussions I reserve the right to restrict their use in class.

Experiments
Over the course of the semester we will be doing a number of in-class experiments. The point of these experiments is to illustrate the ideas that we will be discussing in class, including especially the benefits of social cooperation and the difficulties that groups of individuals face in trying to successfully cooperate with one another. Some of the experiments will have "winners" and "losers" and you may earn extra credit, cash, or other things based on your performance. In no case, however, will your relative performance in the experiments negatively affect your grade. That said, you may be given exam questions that ask you to reflect on these experiments, so if you miss the classes in which the experiments are performed it is your responsibility to debrief with me or your fellow students to make sure you understand what you missed.

Some of the experiments we do may be run utilizing online software. This means that your participation in the experiments will require you to bring a laptop or tablet to class on the days in which we are running experiments. *However, if you do not have a laptop or tablet, this **will not** impact your grade*. Students who do not have a laptop they can bring to class, or who have forgotten to do so, will be allowed to work together with students who do have laptops, in which case any opportunities for extra credit will be shared equally by both students. Alternatively, the University also has laptops available for student use that can be checked out from the lobby of Argyros Forum.

Recommended Texts

There are no required texts for this course. However, it is strongly recommended that you purchase:

1. Hargreaves-Heap, Shaun, Martin Hollis, Bruce Lyons, Robert Sugden, and Albert Weale. *The Theory of Choice: A Critical Guide*. ISBN: 0-631-18322-1
2. Gaus, Gerald. *On Philosophy, Politics, and Economics*. ISBN:0-495-00898-2
3. William Spaniel, *Game Theory 101: The Complete Textbook*, ISBN: 1-4927-2815-2
    There is also an online library of helpful youtube videos associated with this book:
    http://gametheory101.com/courses/game-theory-101/
4. Brian Weatherson has excellent notes on both decision theory (http://brian.weatherson.org/DecisionTheoryNotes.pdf) and game theory (http://brian.weatherson.org/StA-GameTheoryNotes.pdf)

More detailed texts on specific areas if you want to go further:

Decision Theory

1. Savage, Leonard. *The Foundations of Statistics*. ISBN: 978-0486623498
2. Joyce, James. *The Foundations of Causal Decision Theory*. ISBN:978-0-521-06356-2

Game Theory

1. Luce, R. Duncan and Howard Raiffa. *Games and Decisions*. ISBN: 978-0486659435
2. Fudenberg, Drew and Jean Tirole. *Game Theory*. ISBN: 978-0262061414

Social Choice Theory

1. Sen, Amartya. *Collective Choice and Social Welfare: An Expanded Edition*. ISBN: 978-0674919211
2. Riker, William. *Liberalism Against Populism*. ISBN: 978-0881333671

3. Assessment

There are six components to your grade. These are distributed as follows:

Class Participation	15%
Modeling Assignment	15%
Midterm 1	10%
Midterm 2	25%
Final Exam	35%

Grades will be assigned on a numerical scale from 0 – 100, with grades rounded up to the nearest tenth and corresponding to letter grades in the usual way.

94 – 100	A	73 – 76	C
90 – 93	A-	70 – 72	C-
87 – 89	B+	67 – 69	D+
83 – 86	B	63 – 66	D
80 – 82	B-	60 – 62	D-
77 – 79	C+	0 – 59	F

Over the course of the semester there will also be several opportunities to earn extra credit or improve your grade. I encourage you to take advantage of these opportunities. Because I will offer several such opportunities, though, no additional opportunities will be provided. Please don't ask.

Participation (15%)
You will be graded in part on the basis of your participation in class discussions and experiments. Simply showing up will get you no credit. To make expectations for participation clear and fair we will utilize what I call the "Present and Prepared" system. The system works as follows:

> Each day there will be a class roster posted by the door. When you come to class, if you are prepared to participate in class discussion for that day, you can sign the box next to your name. If you do so, you are subject to being called upon in order to help get discussion going, answer a question I have posed for the class, or help us work through a problem. If you do not check the roster for that day, I will not call on you. The roster will be available for the first 5 minutes of class. If you forget to sign the roster or show up late to class you will not get credit for the day. Note, however, that whether or not you sign the roster you are always free to ask questions or participate in class discussions.

> In order to get the full 15 points available for participation you must sign the Present and Prepared roster at least 9 times (that's about 3/4's of our meetings). In order to get 10 points you must sign the roster at least 6 times (about 1/2 of our meetings), and in order to get 5 points you must sign the roster at least 3 times. No other participation grades are possible and, if (for whatever reason) you fail to sign the roster at least 5 times, then you will get no participation points.

> *Abuse*
> In order to prevent abuse of the system, if you have signed the roster, I call on you, and you are clearly unprepared, you immediately lose 5 participation points. This rarely happens, but if it does I will discuss the issue with you immediately after class. Note that the point of this policy is not to trick you. The questions I will ask will merely require that you have done the reading or assignment and are prepared to offer thoughtful answers. Whether you get the answer correct does not matter.

> *Exceptions*
> On rare occasions I will not put out the present and prepared roster. Mostly these will be exam review days, or days when we are beginning a new part of the course. I can't say in advance how many of these days there will be, but there will be ample opportunities for you to sign the present and prepared roster. Plan accordingly! Don't leave things until the end of the semester. Finally, in rare circumstances I may provide a 5 point participation bonus to individuals whose contributions to class discussions are, in my estimation, particularly valuable to the class. Don't count on getting these points, but know that if you consistently benefit your fellow classmates by offering high value contributions to discussion I may reward you.

Modeling Assignments (15%)
Part of your grade will be based on a short writing assignment that will ask you to model a decision or interaction that you have either been involved in or observed. You will be asked to describe a decision and then use the tools and methods we learn in class to develop a model of the decision as well as an analysis of whether the decision was good or bad (and why). Assignments should be approximately 2 pages in length (1 page of written description and analysis and one page to illustrate the model). Late work will not be accepted. However, it is possible that at some point in the semester you will have the opportunity to do a second modeling exercise. In this event, only your highest grade will count, however,

there is no guarantee that this will happen since part of the point of this course is to explore the nature of decision making under uncertainty.

Midterm Exams (1ˢᵗ 10% 2ⁿᵈ 25%)
There will be 2 midterm exams. The first will test material covered in the first two weeks of class as well as some basic probability theory, but will only be worth a small fraction of your grade. The second will cover more material and will, accordingly, be worth more. The format of each exam will be made clear in the weeks leading up to it. They will always involve one or more problems for you to work through and may involve an essay question and/or a take-home component. During the week of the exam I will set aside time in class for you to ask questions about the exam. Additionally, I will hold extended office hours during that week so that you have the opportunity to ask questions outside of class. Exams cannot be made up at a later date except in extreme circumstances.

Final Exam (35%)
There will be a comprehensive final exam covering material from all three parts of the course. As with the midterm, the format of the final exam will be made clear in the weeks leading up to the exam, and we will devote at least part of the last week of class to review for the final.

4. Course Feedback

It is important for instructors to get feedback about the courses they teach. You typically have the opportunity to do this at the end of the semester when the university asks you to fill out course evaluations. In order to make the class better for *you*, though, I want to encourage you to give me feedback over the course of the semester on how you think the class is going. If there are certain assignments, readings, or aspects of class that you find especially helpful *or* unhelpful please let me know!

My goal is for you to get as much out of the class as possible, but in order to meet that goal I need to know how I'm doing. To encourage you to do this I'm willing to offer up to 3% extra credit on your final grade for any constructive feedback that you provide. You will receive a 1% bump on your final grade for each constructive email you send (up to 3). The feedback can be positive or negative. If I'm doing something that isn't working or that you think is wasting your time please tell me! To get credit however the feedback must be useful, i.e. you must briefly explain why things aren't helpful (or why they are), and there's no sense complaining about things that I have no control over, for instance the time the class meets (the University chooses that not me).

5. Policies

Attendance, Holidays, and Absences
Attendance is expected in this course, regular participation in class discussions and experiments provides a benefit to your classmates and so those who participate will have their contributions reflected in their grades.In accordance with University policy the course will observe all holidays recognized in the official University Academic Calendar. We will not meet on University holidays, nor will work be assigned to be done on those days. Additionally, holidays or special events observed by organized religions will be honored for those students who affiliate with a particular religion, and absences either pre-approved by the Dean of Students (or Dean's designee) or associated with a serious medical condition will also be honored.

Students with Disabilities

In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that might affect their ability to perform in this class are encouraged to contact the Office of Disability Services. If you will need to utilize your approved accommodations in this class, please follow the proper

notification procedure for informing your professor(s). This notification process must occur more than a week before any accommodation can be utilized. Please contact Disability Services at (714) 516-4520 or (www.chapman.edu/students/student-health-services/disability-services) if you have questions regarding this procedure, or for information and to make an appointment to discuss and/or request potential accommodations based on documentation of your disability. Once formal approval of your need for an accommodation has been granted, you are encouraged to talk with your professor(s) about your accommodation options. The granting of any accommodation will not be retroactive and cannot jeopardize the academic standards or integrity of the course.

Chapman University Academic Integrity Policy

Chapman University is a community of scholars, which emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work, and academic dishonesty of any kind will not be tolerated anywhere in the university. If you ever have any questions about what this policy requires of you please contact me before you turn in the relevant work.

Equity and Diversity

Chapman University is committed to ensuring equality and valuing diversity. Students and professors are reminded to show respect at all times as outlined in Chapman's Harassment and Discrimination Policy: http://tinyurl.Com/CUHarassment-Discrimination. Any violations of this policy should be discussed with the professor, the Dean of Students and/or otherwise reported in accordance with this policy.

6. Schedule

Week 1—Intro		
	W 1/2	Decision, Strategy, & Collective Choice
	R 1/3	Foundations of Decision Theory
Week 2—Decision Theory		
	M 1/7	Choice & Uncertainty
	T 1/8	Choice & Risk
	W 1/9	Modular Rationality & Dominance
	R 1/10	Decision Theory Paradoxes & Philosophical Issues
Week 3—Game Theory		
	M 1/14	Foundations of Game Theory
	T 1/15	Solutions Concepts in Non-Cooperative Games
	W 1/16	Repeated Games
	R 1/17	Cooperative Games & Bargaining
Week 4—Collective Choice		
	M 1/21	No Class (MLK Day)
	T 1/22	Foundations of Social Choice
	W 1/23	Majority Rule & Alternative Voting Rules
	R 1/24	Chaos & Manipulation