Philosophy 401B: Decision Theory

Course Mechanics

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Course Description

What is rationality? That is the central question of our course. Over the last three centuries, decision theory has emerged as the primary tool for investigating questions about both epistemic and pragmatic rationality, i.e., for investigating questions about what it is rational to *believe* and *do*, respectively. This course is a philosophical introduction to decision theory. We will study the fundamental theorems of expected utility theory and investigate the extent to which, if any, they justify the broader philosophical claim that rational decision-makers behave as if they were trying to maximize expected utility.

Learning Objectives

By the end of this course, students will be able to

1. Distinguish and apply several common (non-probabilistic) rules for decision-making (esp., maximin and minimax regret).
2. Reconstruct at least two arguments for *probabilism*, i.e., the thesis that one's degrees of belief should be represented by a probability function.
3. State von Neumann and Morgenstern's expected utility theorem, and reconstruct arguments that use the theorem to conclude that rational preference is representable by a numerical utility function. In particular, students should be able to summarize the normative arguments (e.g., money pumps) for the various "axioms" (e.g., transitivity) of rational preference and to identify whether such arguments rely on (i) synchronic or diachronic standards for coherence, and (ii) strict or weak dominance principles.
4. State at least one representation theorem (e.g., Savage's) used in defenses of the claim that rationality requires maximizing *subjective* expected utility.
5. Reconstruct at least one argument for the (normative) thesis that rational decision-makers should act as if they maximize subjective expected utility.
6. Summarize the Allais and Ellsberg paradoxes, as well as other phenomena used to motivate prospect theory.

Requirements

Reading Assignments and Classroom Participation

The main requirement for the course is that you engage with the assigned readings and then come to class prepared to work and learn with others. To ensure that you are prepared for classroom discussion and activities, there are short reading assignments due each class. Don't worry. I recognize that it is very difficult for most students to be prepared for absolutely every class, and so your two lowest scores on these assignments are "dropped" at the end of the quarter; see below for more information about grading.

Although philosophers often claim that philosophical writing exemplifies clarity of thought, the assigned readings are often very difficult, and they are sometimes long as well. Thus, above all, this course requires patience and a willingness to engage with difficult philosophical

and technical texts. Importantly, it is well known that students learn more from doing the assigned readings than from lecture and/or class discussion,[1] and so you should not view classroom activities as a replacement for reading carefully.

Longer Assessments

All students must complete *three* longer assessments for the course, each worth 22% of your final grade. One longer assessment must be a paper, and two must be problem sets. There are two paper topics and four problem sets from which you may choose.

Grades

Why We Have Grades

There are many purposes that grades could serve. Here are four:

(1) they can provide you with feedback about how well you have mastered the material,

(2) they can indicate your performance relative to that of other students,

(3) they can motivate you to learn the course material well, and

(4) they can provide future instructors, graduate schools, and potential employers with information.

These various purposes conflict with one another. For example, if an instructor assigns "average" work a "C" grade because he or she thinks that grades ought to indicate the relative performance of students (i.e. fulfill the second function), then every student in the class would earn a "C." Similar reasoning shows that the other criteria also conflict with one another.

For these reasons and others, I use grades only for the first and fourth purposes, namely, to provide you (and others) with feedback about how well you have learned the skills and facts taught in the course. Very roughly, a final grade above 3.7 indicates that your knowledge of the course material and your performance of the skills taught in the course are both excellent; a grade between 3.3 and 3.6 indicates they are very good; a grade between 2.7 and 3.2 indicates that you have acquired a general understanding of the material and skills, but you have missed some finer points; a grade lower than 2.7 indicates that your work contains some very serious errors and misunderstandings. I fail students only when their work contains very serious errors and misunderstandings throughout.

Rubrics and Regrades

I use rubrics when assigning grades on more substantial assignments (e.g., papers and problem sets). Rubrics contain detailed descriptions of which skills you are performing well and which are in need of improvement. I encourage you to look at the rubrics before you write your papers so that you know exactly how you will be assessed. Even better, find a partner and grade each other's papers using the provided rubrics. Doing so gives you experience evaluating philosophical work and will improve your own writing.

Reading assignments are graded primarily for completion; you will rarely receive less than full credit unless your work is incomplete, and so students almost never request that such work be regraded.

In general, I do not regrade longer assessments unless I have made an arithmetic error in calculating your score. I would be happy to clarify why you received the grade that you did.

[1] Hartman, "Recognition learning under multiple channel presentation and testing conditions".

"Dropped" Assignments and Additional Papers and Problem Sets

Your lowest two scores on reading assignments will be dropped at the end of the course. If you choose not to submit two reading assignments, therefore, it will have no effect on your final grade.

As noted above, only three longer assessments are required for the course. However, if you choose to submit four or more papers and problem sets, then only your three highest scores will count toward your final grade. To put it another way, all but your three highest grades on papers and problem sets are "dropped" at the end of the quarter.

Because the assessments become more difficult as the course progresses (and because students become busier), there is a further incentive to submit additional longer assessments, however. Namely, if (a) you score above 50% on an additional longer assessment but (b) that score is below what is currently your third-highest grade on the longer assessments, then I will multiply your existing lowest grade by 1.05. For example, suppose you have completed two problem sets and one paper, and suppose your scores on those three assignments are $80\%, 85\%$, and 90% respectively. You decide to submit an additional problem set to see if you can improve upon your existing lowest score (namely, 80%). Unfortunately, you run out of time and are able only to complete part of the most recent problem set. So you submit your incomplete work and receive a grade of 60%. Luckily, your time has not been wasted: in addition to learning enough to receive a 60%, your 80% grade on the previous problem set is now transformed to $1.05 \cdot 80\% = 84\%$. You can submit as many of the longer assessments as you would like and keep raising your scores on previous assignments in this way.

Final Grades

Your final grade (as a percentage) is a weighted average, which is calculated using the following weights:

- Longer assessments: 66% cumulatively. Each problem set and paper is worth the same amount, i.e., each is worth 22%.
- Reading assignments: 34%. Again, all such assignments are worth the same amount.

Your final grade will be converted to a four-point scale using the following equation:

$$\text{Four-Point Scale} = \frac{\text{Percentage}}{10} - 5.5$$

For example, if your final percentage is 90%, then your final grade will be $3.5 = \frac{90}{10} - 5.5$.

Unless there is a compelling reason (e.g., you are hospitalized), I will not assign "X" or "I" grades at the end of the quarter.

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Submitting Assignments

Reading assignments must be submitted on *paper* at the end of every class. You must bring a paper copy of your assignment to class so that you can refer to your answers during class. If you are more than 20 minutes late for class, I will not accept your reading assignment unless you obtained my approval prior to class (e.g., because you will be arriving to class late due to a special event elsewhere on campus). Do *not* email me your reading assignment, even if you are absent. Do not upload your reading assignment to Canvas *unless* you wish it to count as one of your two late/out-of-class reading assignments. See policy about late work below.

To be clear: because I will accept two reading assignments outside class and because two reading assignments scores are dropped at the end of the quarter, I will not accept any further

reading assignments submitted outside of class *even if you are ill and unable to attend class.* The course policies allow you to miss two weeks worth of classes (i.e., 20% of the course) with no impact on your grade. If you need to miss more than 20% of class (because you develop some recurring illness), you need to set up an appointment to speak with me (either in-person or via Zoom) so that we can make sure you can succeed in the course.

Due dates for the papers and problem sets are listed on Canvas and on the Reading Schedule. By choosing to complete a particular assessment, you are also choosing to submit that assessment by the associated due date. For example, if you choose to write Paper 2, then your paper is due by the Paper 2 due date; you are *not* permitted to submit Paper 2 when some later deadline arrives. Plan ahead.

All papers should be submitted electronically via Canvas by **midnight** on the appropriate due date. Please do not email me your papers and/or assignments unless you have already tried to upload them via Canvas. When a class exceeds even a small number of students (e.g., ten), it is difficult for an instructor to organize and maintain a record of students' work if it is submitted via email.

All problem sets are due by 5PM *sharp.* You may submit a problem set in one of two ways. First, you may *type* your problem set and submit it either in-person or electronically via Canvas. Do not scan and upload a handwritten document to Canvas. If you type your problem set, you must typeset your document using LaTeX, Microsoft Word, or OpenOffice, and you must convert your problem set into a PDF file before submitting it. A template .tex file is available on Canvas for you to use if you would like to use LaTeX. Do *not* submit a spreadsheet (e.g., a Microsoft .xls file) as your problem set.

Second, you may turn in a hard copy of your problem set either in class or in the box in front of my office. You must staple your work if your problem set is more than one page. Do not drop off your assignment in the philosophy department's main office; your problem set will be marked as late if I need to retrieve it from the main office . My office number is Savery M399. It is located on the third-floor mezzanine in Savery Hall (look for floor 3M in the staircase or elevator). The mezzanine is automatically locked at 5PM exactly, and so if you show up 15 seconds late, you will not be able to turn in your problem set until the next day.

Late Assignments and Extensions

Late reading assignments will be accepted no more than twice in the quarter. One primary goal of those assignments is to prepare students for class discussion, and if you have not finished the reading assignment before class, you are not prepared for class discussion. However, sometimes students are unable to print their reading assignment before class. On other occasions, students simply forget to bring a reading assignment that they have completed. On these occasions, a student may submit their reading assignment on Canvas by midnight on the due date. If your reading assignment is handwritten, you must *scan* it to upload it. *Do not upload a photograph of your reading assignment that is taken using your phone.*

With respect to the longer assessments (e.g., problem sets and papers), I will grant one 72-hour extension without asking any questions. The 72-hour extension cannot be "split" across multiple assignments (e.g., you cannot take a 24-hour extension on one assignment and a 48-hour extension on another).

You do not need to ask me for an extension. In fact, you should not notify me that you plan to use your extension unless you need to meet with me to discuss the assignment in the 72-hour extension window. If you are having difficulty completing an assignment, I encourage you to come talk to me.

Collaborative Work

I encourage you to collaborate. Feel free to share drafts of your papers with other students. I also encourage you to ask a peer to grade your paper with the rubrics I make available.

When completing problem sets, you may work together with other students if you would like. If you work with other students, I ask that you follow three rules. First, please write the names of all students with whom you have worked at the top of your problem set. Second, although you may work together, you should write the final draft of your problem set *alone*. In particular, do not simply copy answers from a common chalkboard where you have worked. Take notes at group meetings, and internalize the answers you have found. Then return to your apartment, dorm room, or house and rewrite the assignment. Finally, problem sets should never be "divided up." For example, you should *not* find a friend who will complete one half of the assignment if you complete the other half. I expect you to work *together* and not as successive stations in a factory assembly line.

Office Hours and Paper Drafts

I *strongly* encourage you to attend office hours if you need any help or have any questions about the problem sets or papers for the course. My experience is that, in upper-division philosophy courses in which there is some mathematical content (like this one), office hours are under-utilized by students. I have added this section of the syllabus with the hope that students will read it and attend office hours when they need to do so.

If you have not completed a problem set for a STEM course in several years, you will likely need some help finishing the problem sets for this course. Come ask me questions if you have them.

If you have not written many papers for upper-division philosophy courses, I encourage you to share a draft of your papers with me before office hours. Then attend office hours so that we can talk about your draft together. For what it is worth, I find that it is easiest to help students who share a Google Doc and provide me with editing access; this allows me to leave comments on the draft directly.

To be clear, you may also attend office hours even if you do not have any questions about an upcoming paper or problem set. You may come to talk to me about the assigned readings for the class, or to ask for reading recommendations, or to talk about life more generally. However, if you do not have questions about an upcoming assignment and another student does, I will prioritize helping the other student first.

You should not email me to announce you plan to attend office hours unless you are sending me a draft of a paper. Just show up, and I will be happy to talk to you.

Large Language Models

Large language models (LLMs) like ChatGPT should not be used in any way for completing reading assignments. One primary purpose of those assignments is to force you to practice writing several times a week. If you ask an LLM to write answers for you, one of the primary purposes of those assignments is thwarted. Remember, reading assignments are graded for completion, and so incorrect answers and awkward writing are not penalized.

You may choose to use LLMs to *edit* your papers and problem sets. For example, you may ask an LLM to correct any grammatical mistakes you have made in a paragraph. Or you might ask an LLM to make a paragraph of your paper more succinct. If you use an LLM in this way, please submit both (1) the draft of your paper or problem set and (2) the "conversation" you had with the LLM so that I can see the prompts you provided. You might ask an LLM to check your solution to an exercise on a problem set. My experience is that LLM responses to such prompts are not reliable, however. So use LLMs with caution.

Use of LLMs for any other purpose is *prohibited*. For example, you are prohibited from writing an outline of a paper and asking an LLM to write the paper based on that outline. Similarly, you are prohibited from copying-and-pasting exercises from problem sets into LLMs and asking the LLM to complete the exercise for you. If it is clear that you have used an LLM in one of these ways, I will assign you a zero grade for the assignment.

Using an LLM in a prohibited way will not be in your best interest, even if you want to complete a problem set or paper quickly. In brief, there are two reasons to avoid using LLMs in a prohibited way. First, LLMs make mistakes, and if you can check the output of an LLM for those mistakes, then you could have completed the assessment on your own and learned more. Second, to hide the use of an LLM, you would need to edit the content, phrasing, and formatting of LLM responses. Editing an LLM's response, therefore, is often no less time-consuming than completing an assessment yourself.

You might believe that I will be unable to tell if you've used an LLM. You might be right. But I encourage you to read the following.

Since the first public release of ChatGPT, I have entered all of my paper prompts and problem sets into a handful of LLMs before I teach a course. The results are impressive in many ways. But they are also problematic in others.

With respect to essay prompts, many existing LLMs produce essays with extraneous information. Further, several leading LLMs are programmed to avoid taking a stand on issues. LLMs have a habit of producing insipid and vague statements like "There are many views about whether abortion is moral, and it is difficult to say if any is correct." But in philosophy papers, you are *required* to take a stand. As noted above, LLMs also make mistakes, and even worse, sometimes they make things up completely (or "hallucinate" if you prefer).[2] I have asked LLMs to summarize all of the assigned philosophical articles in our class; some of the "summaries" are almost entirely fabrications of some type. So if a student paper contains such fabrications, it will be obvious to me that the paper was generated by an LLM.

With respect to problem sets that I have designed, LLM answers are typically more accurate now than they were a year ago. It is now impossible for me to design problem sets that both (i) contain exercises that are reasonable for introductory students and (ii) contain only exercises that are consistently answered incorrectly by LLMs. But here is my warning. Not all of the answers produced by the LLMs in response to the problem sets for this course are correct; some are woefully misguided. Further, each LLM formats answers to prompts in particular ways, and editing those answers in a way that would be undetectable to me requires some time and effort.

In short: Most students enroll in a course with the desire to learn the course material. The best way to do that is to complete the assessments on your own first. Then use LLMs for feedback and help if you would like. Ideally, get feedback from your instructor and peers about the ways that you have used an LLM to help you. Doing so will help you make the best use of the LLMs.

Computers in the Classroom

I encourage you to leave all computers at home. Instead, I suggest that you bring a notebook, a pen or pencil, and hard copies of the assigned readings. Extensive empirical evidence indicates that students who use computers learn less for two reasons. First, students who use computers often attempt to "multi-task" (e.g., take notes, read, and browse the internet simultaneously), and extensive research shows that (i) no one can multi-task effectively, and (ii) multi-tasking hinders learning. Further, research shows that even those students who use

[2] One LLM once told me I had published articles in *The Atlantic* and *New England Journal of Medicine*. I wish it were so!

computers exclusively for note-taking still learn more when they take notes by hand.[3]

Nonetheless, there is one compelling reason for using a computer in my class. Textbooks are expensive, and many of you do not have several hundred dollars to spend on books each quarter. That's why I provide you with electronic copies of all assigned readings. For this reason, many of you may wish to bring a laptop to class so that you can refer to the readings. I understand, but if you have the ability to purchase the textbook for this class, I ask you to consider how small the price of a textbook is in relation to its educational value.

So here is my policy on computers in the classroom. You may not use phones or any other hand-held devices during class. You may bring a laptop to class, but it can be used only for note-taking and/or referring to the readings assigned for the day. If you bring a computer, turn off your Wi-Fi and disconnect from all networks immediately upon entering the classroom. If I (or any other student) sees that you are browsing the internet, instant messaging, playing video games, or engaging in some other non-academic activity during class, you forfeit the right to use a computer in the classroom. When you browse the internet in class, you harm not only your own education but also that of the students around you.

Students with Disabilities

If you have a disability that may affect the quality of or timeliness with which your work is submitted, please visit Disability Resources for Students (DRS) at the beginning of the term and have them send me appropriate suggestions concerning how to modify course requirements. I want every student to succeed, and I am more than happy to adjust the course so that it suits you. The DRS website is listed in the important websites section at the end of this document.

Academic Integrity

Almost no student plans to cheat or plagiarize at the beginning of the term. The two most common reasons for plagiarism are (1) ignorance of what constitutes plagiarism and (2) lack of planning. In other words, students plagiarize most frequently because they either do not know what "plagiarism" means or they run out of time (and think that copying another person's paper is a quick fix). Here is how you can make sure that you do not plagiarize.

First, read the College of Education's definition of "plagiarism", which can be found in the list of websites below. If you know the definition of "plagiarism," then you are less likely to plagiarize. Second, ask for extensions when you need them, and come talk to me if you need extra time. I know what it is like to have too much to do and not enough time. Let's try to find a solution together.

If, despite your best intentions and my advice, you find yourself contemplating cheating in the future, you should know two things. First, the penalties are extremely high, and second, the chances that I catch you are fairly high. Why are the penalties high? You will receive a zero on any assignment on which you cheat. Perhaps even more important, I am required to report your conduct to the Dean of Arts and Sciences. You will then attend an embarrassing and time-consuming trial-like procedure in which the Committee on Academic Conduct will evaluate your conduct and issue some form of punishment. Some penalties are small (e.g., warning or probation), but the committee may also suspend or dismiss you from the university.

It's much easier (and better practice for post-college life) to *ask for help* when you need it. Work out an arrangement with me instead of resorting to cheating.

Resources and Websites

You are attending a great university with a huge number of resources that will help you succeed. Here are some suggested resources.

[3] Mueller and Oppenheimer, "The Pen Is Mightier Than the Keyboard Advantages of Longhand Over Laptop Note Taking".

Resource	Website
Philosophy Writing Center	http://www.phil.washington.edu/resources/writing-center
Clue Writing Center	http://depts.washington.edu/aspuw/develop/writing-center/
Disability Resource Services	http://depts.washington.edu/uwdrs/
Definition of Plagiarism	https://education.uw.edu/foryou/students/academic-conduct

Miscellanea

Additional information about academic integrity, obtaining incomplete grades, campus safety, appealing your grade, and more can be found in the syllabus attachment document on the course website.

References

[1] F. R. Hartman. "Recognition learning under multiple channel presentation and testing conditions". In: *Audiovisual communication review* 9.1 (1961), pp. 24–43.

[2] P. A. Mueller and D. M. Oppenheimer. "The Pen Is Mightier Than the Keyboard Advantages of Longhand Over Laptop Note Taking". In: *Psychological Science* (Apr. 2014), pp. 1159–1168.