Philosophy 321/01: Induction, Decision and Game Theory

University of British Columbia
Department of Philosophy
Fall 2022
MWF 11-12, Buchanan B-313

Instructor	Office	Telephone	E-mail	Office Hours
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Description: There are two well-developed philosophical theories that try to characterize what it means to make choices rationally. One is decision theory, which considers the position of one agent choosing between several alternatives, with varying levels of information about factors that might influence the resulting outcomes. The other is game theory, which provides techniques for analyzing interactions among several rational agents.

This course explains the fundamentals of these two theories and relevant background concepts such as probability and utility. We also explore paradoxical situations where the theories appear to clash with ordinary intuitions about rationality. We will consider applications throughout the course, with emphasis on social applications of game theory, and conclude with an introduction to evolutionary game theory and a discussion of Skyrms' book, *Evolution of the Social Contract*.

Students who take this course should feel comfortable with technical work. I recommend having taken Phil 120 (Critical Thinking), Phil 125 (Scientific Reasoning), Phil 220 (Logic), or any introductory-level course in mathematics, computer science or economics. Please speak to me if you have any concerns about this aspect of the course.

I. Course learning objectives.

1) You will acquire the technical skills to solve simple problems in decision theory, game theory and evolutionary game theory.

2) You will be able to discuss and evaluate (briefly) central philosophical issues and puzzles about rational choice that have emerged in all three areas.

3) You will develop skills to engage in the detailed assessment of an important philosophical issue in decision theory, or some application of decision theory to a philosophical problem, in a term paper.

II. Texts.

[P] *An Introduction to Decision Theory*, *2ⁿᵈ ed.* Martin Peterson (Cambridge University Press, 2017). Available in bookstore.
[SC] *Evolution of the Social Contract*, 2ⁿᵈ ed. Brian Skyrms (Cambridge University Press, 2014). Available in bookstore.
[X] Extra materials. Linked through syllabus, or use Online Course Reserve link (LOCR) on left side of Canvas page, or open the "Links to additional required readings" in *Modules → Additional Readings*.

III. Requirements: The final grade will be based upon the following scheme:

	Weight
Three problem sets (5% each)	15%
Mid-term test (Oct. 21)	20%
Term Paper (2000-2500 words/7-10 pages — due **Dec. 9**)	30%
Final exam (exam period)	35%

Problem sets: These will be distributed with at least two weeks notice, and submitted via the Canvas page. **Submission deadlines for problem sets are strict: no late submissions can be accepted**.

Mid-term test: This is a one-hour test that will take place during the **Friday Oct. 21** lecture.

Term paper: Topics wil be distributed by **October 26**. Students may propose their own topics if they submit a proposal by **November 14**; I'll review the proposal as quickly as possible. The **late penalty** is 5% per day, unless there are clear grounds for accommodation.

Final exam. There will be a two-hour final examination during the exam period. More details will be provided during the course.

IV. Course organization. You will need to organize your schedule to keep on top of the material and the assignments. The key organizational tool is the **Canvas page**. In addition to the lectures, there are multiple ways to learn the course material, as follows:

- **Independent reading.** As with any course, you will learn through careful reading of the assigned material, following the schedule posted below (Lecture and Assignment Schedule).

- **Posted lecture overheads.** The lecture overheads are posted in the "Modules" section of Canvas. These overheads typically do not capture everything that is said in the lectures.

- **Posted handouts and assignments.** Copies will be posted in the "Modules" section of Canvas.

- **Office hours.** I will hold one in person office hour (Mon 1-2) and one online office hour (Wed 1-2) per week, via Zoom. The online office hours will be scheduled in the Zoom section of Canvas. If you require an additional meeting time, please send me an email message and we can set up a private meeting either in person or using Zoom.

- **Canvas Discussion.** I encourage you to raise questions of general interest using **Piazza**.

V. Course calendar. The course calendar on Canvas lists all assignment dates, apart from the final exam. This course syllabus also includes a Lecture and Assignment Schedule that lists assignment dates, topics and readings for each class.

VI. Announcements. Please read carefully all announcements posted throughout the term. These will include course updates, information about upcoming assignments, changes to assignments or due dates, corrections, and important alerts. They will remain posted in the **Announcements** section of Canvas.

VII. Assignments: submission and records.

Most assignments, even where copies are distributed in class, will be administered through the **Assignments** tab in Canvas. The **Problem Sets** and **Term Paper** must be submitted as pdf file uploads, by the posted deadline, using the portal in the **Assignments** section. (This is subject to change: I may set up submission of term papers via Turnitin.com.)

Assignment grades will be recorded and posted to Canvas in the **Grades** section. **Important:** although the grades will be accurate, please ignore any cumulative grade scores computed by Canvas. I will use a separate spreadsheet to compute cumulative grades. Please inform me of any discrepancies between assignment grades on Canvas and your own records.

General policies and other matters:

Academic accommodation: UBC Access & Diversity works with all instructors to provide appropriate accommodation for students with disabilities. Please notify Access and Diversity of your situation well in advance of any assignment due dates, and please feel free to discuss with me any way in which I can be of assistance.

For those new to philosophy, there is a Philosophy Essay clinic that offers help for those who wish to improve their philosophical writing skills. The website will be updated with the names and schedule of the instructors. I also encourage you to speak to me during my office hours.

Students are responsible for ensuring that they understand and abide by the UBC regulations concerning academic misconduct and **plagiarism**. Plagiarism is a very serious academic offense. If you are unsure about any issues relating to academic integrity, please consult with me or with your academic advising office. In particular, **all work done on tests and papers must be your own**.

Statement of UBC values and policies:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated, nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here.

Tentative Lecture and Assignment Schedule

Week of	Topics and Readings	Assignments/holidays
Sept. 5	Introduction; Basic Concepts of Decision Theory [P] 1, 2	**First class Sept. 7**
Sept. 12	Basics (cont.) and Decisions Under Ignorance [P] 2, 3; [X] Manson, "Formulating the Precautionary Principle" (OLCR)	
Sept. 19	Decisions under Risk [P] 4	
Sept. 26	Utility and Probability [P] 5, 6; [X] Hájek, Pascal's Wager and infinite utility	
Oct. 3	Probability and its interpretations [P] 6, 7	**PS 1 due Oct. 3**
Oct. 10	Preference axioms; Newcomb's problem [P] 8, 9	****No class Oct. 10**
Oct. 17	Newcomb and Causal Decision Theory [p] 9; [X] Egan, "Some counterexamples to causal decision theory"	**Mid-term test: Oct. 21**
Oct. 24	Bayesianism; Game Theory I [P] 11	
Oct. 31	Game Theory II [P] 12	**PS 2 due Oct. 31**
Nov. 7	Social Choice Theory [P] 13	**Midterm Break: Nov. 9, 11**
Nov. 14	Social Choice Theory (cont'd); Evolutionary Game Theory [SC] 1, 2	
Nov. 21	Evolution of the Social Contract [SC] 2, 3	
Nov. 28	Evolution of the Social Contract [SC] 4, 5	**PS 3 due Nov. 28/Dec. 5**
Dec. 5	Evoluation of the Social Contract (cont'd)	**Term paper: Dec. 9**

Note: This schedule may be revised as the course progresses.