



PHIL 321 002 – Induction, Decision and Game Theory

Winter Term 2, 2025 (Jan. 5 – Apr. 10, 2026)

Tue Thu 12:30pm – 2pm, LASR 104

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Office hours: by appointment

Course Description:

In this course we will examine two different approaches to the question of what it means to make choices rationally: decision theory and game theory.

- **Decision theory.** Decision theory considers the situation of an agent who is making a choice among several alternatives, and who may face risk and/or uncertainty about factors beyond his/her control that influence what outcomes result from his/her choice. We will develop a theory of what principles of rational choice should guide a decision-maker.
- **Game theory.** Game theory provides a formalism with which we can analyze strategic interactions – situations where the outcomes of an agent's decisions are determined (at least in part) by what other players do. We will look into a theory of rational choice in strategic situations.

To the extent that people actually follow principles of rational choice, the theory allows one to make predictions about the outcome of many social interactions; decision theory and game theory have proved to be an invaluable tool in a wide variety of areas including economics, statistics, business, psychology, evolutionary biology, political science, mathematics, computer science and philosophy.

Required Texts:

- Martin Peterson, *An Introduction to Decision Theory*, Cambridge University Press, 2009. Available in bookstore.
- Additional material available at the course website: www.canvas.ubc.ca.

Prerequisites:

Students taking this course should feel comfortable with technical mathematical work. I recommend having taken any one of the following courses: Phil 120 (Introduction to Critical Thinking), Phil 125 (Scientific Reasoning), Phil 220 (Symbolic Logic), or an introductory-level course in mathematics, computer science or economics. Please see me if you have any questions about whether you have the appropriate background for this course.

Class Format:

The general format of the class is a mixture of lectures, in-class discussions, online small group discussion activities, in-class tests, and review of assignments. The lectures will invite participation from the students, but their main goal is to introduce and illustrate concepts.

Course Objectives:

The primary objective of this course is to teach how to analyze situations of a rational agent making a choice between several alternatives and the situations of strategic interaction between several agents. In doing so you will become familiar with the terminology and basic definitions of decision theory and game theory as well as solution concepts employed in both theories to predict what the outcome of a specific situation will be. Although we will have occasions to discuss examples and applications of decision and game theories in a wide variety of areas (economics, statistics, business, evolutionary biology, psychology, political science, and philosophy), our primary emphasis will be on *philosophical* issues. This means that we will focus on the *conceptual foundations* of decision and game theory, with special attention given to certain *puzzles* (e.g., Newcomb's paradox and the Prisoner's Dilemma).

Course Website: www.canvas.ubc.ca → PHIL 321 002 2025W2

Evaluation:

Three Discussion Activities	15%
Three In-Class Tests	45%
Final Exam	40%

- **Discussion Activities:** We'll have three online small group discussion activities. Prior to that every student will be assigned to one of several small groups (10 or so students), within which he or she will be expected to take part in all of these group discussions. The more detailed instructions on the group discussions will be given shortly prior to the first DA. The purpose of the activity is to give you real practice and peer feedback before the upcoming tests and final exam. The weight of all the (equally weighed) group discussions is 15% of your final grade.
- **In-Class Tests:** There will be three in-class tests. All (equally weighted) tests are worth 45% of your final grade.
- **Final Exam:** There will be a regular 2.5-hour-long paper-based sit-down final exam at the end of the course. The final exam counts for 40% of your final grade. The exam is cumulative as students are deemed responsible for all the material covered in this course.

Tentative Course Schedule:

Week #	Lesson / Textbook Chapter
Week 1 / Jan. 5	Introduction to Decision Theory (Chapters 1, 2)
Week 2 / Jan. 12	Decisions Under Ignorance (Chapter 3)
Week 3 / Jan. 19	Decision Under Risk. Utility (Chapter 4, Sections 4.1, 4.2, 4.3; begin reading Chapter 5)
Week 4 / Jan. 26	Utility. Interpretations of Probability (Chapters 5, 6, 7)
Week 5 / Feb. 2	Bayesianism. Pragmatic arguments (Chapter 8)
Week 6 / Feb. 9	Puzzle Cases: Allais' Paradox; Ellsberg's, St. Petersburg, Pasadena, Two-envelope paradoxes (Chapter 4, Sections 4.4, 4.5, 4.6, 4.7, 4.8)
Feb. 16 – Feb. 20	Family Day and Mid-Term Break
Week 7 / Feb. 23	Newcomb's Paradox. Causal vs. Evidential Decision theory (Chapter 9)
Week 8 / Mar. 2	Psychology and Decision Theory (Chapter 14)
Week 9 / Mar. 9	Introduction to Game Theory (Chapter 11)
Week 10 / Mar. 16	Failures of Equilibrium. Prisoner's Dilemma (Chapter 12, Sections 12.1, 12.2, 12.3, 12.4)
Week 11 / Mar. 23	Evolutionary Game Theory (Chapter 12, Sections 12.5, 12.6)
Week 12 / Mar. 30	Stag Hunt Game and Some Further Applications of Game Theory
Week 13 / Apr. 6	Wrapping Up
Exam Period Apr. 14 – Apr. 25	Exact time and location TBA

IMPORTANT NOTE:

This schedule is tentative and may be revised as the semester unfolds. All changes to the schedule will be announced in class (and only in class – if you miss a lecture, please make sure you find a way to inform yourself about the announcements made in class).

Academic Concessions, Missed Assignments, and Grade Changes:

According to the newly revised University Academic Concession policy taking effect on Sep. 1, 2019, students must contact me, the instructor, via email as soon as you are aware you may need an in-term concession. I will adjudicate your **first** request. You need to include a Student Self-Declaration form, found on the Arts Advising website at

students-2016.sites.olt.ubc.ca/files/2018/01/Academic-Concession-Form-2-page-January-2018.pdf

Please note that, according to the new policy, for all **consecutive** concessions (second, third, etc.), you must make your request directly to your appropriate Faculty Advising Office. The official guidelines of what types of academic concessions are available to you and what procedures you need to follow to request them can be found at the following page:

students.arts.ubc.ca/advising/academic-performance/help-academic-concession/

As a rule, there'll be no make-ups for the graded activities because the answer keys for the assignments with the explanations are typically revealed to the class after the assignment deadline. If you do have a University valid excuse for missing them (see above about Academic Concession), I will transfer the weight of what you have missed to the weight of your final exam.

If you wish to have a grade reconsidered, write a brief note stating your reason. Typically, the note will outline what you take to be the requirements of a good answer and point out where you believe you met these requirements.

Learning Analytics:

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the Canvas Learning Management System, capturing data about your activity and providing information that can be used to improve the quality of teaching and learning.

Overall, in this course, I may use analytics data to

- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion activity forums and in the course in general
- Assess your participation in the course.

University Policies:

- **UBC General 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 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 on the UBC Senate website at senate.ubc.ca/policies-resources-support-student-success

- **UBC Plagiarism Policy:**

Plagiarism, which is intellectual theft, occurs where an individual submits or presents the oral or written work of another person as his or her own. Scholarship quite properly rests upon examining and referring to the thoughts and writings of others. However, when another person's words (i.e. phrases, sentences, or paragraphs), ideas, or entire works are used, the author must be acknowledged in the text, in footnotes, in endnotes, or in another accepted form of academic citation. Where direct quotations are made, they must be clearly delineated (for example, within quotation marks or separately indented). Failure to provide proper attribution is plagiarism because it represents someone else's work as one's own. Plagiarism should not occur in submitted drafts or final works. A student who seeks assistance from a tutor or other scholastic aids must ensure that the work submitted is the student's own. Students are responsible for ensuring that any work submitted does not constitute plagiarism. Students who are in any doubt as to what constitutes plagiarism should consult their instructor before handing in any assignments. A link about Academic misconduct is as follows:

www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959

- **Students with special needs:**

Students who require accommodations in this course due to a disability affecting mobility, vision, hearing, learning, or mental or physical health are advised to discuss their needs with the Disability Resource Centre at Brock Hall, Room 1203, 1874 East Mall or visit their website at

you.ubc.ca/ubc-life/campus-community/students-disabilities

Copyright:

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