

Modeling Choice Behavior

PPE4803/PSYC2803

Fall 2024

3600 Market Street 108

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Office hours by appointment

How do people decide and how can we study decision processes using formal mathematical and computational models? This course will address this question. It will examine popular quantitative modeling techniques in psychology, economics, cognitive science, and neuroscience, and will apply these techniques to study choice behavior in risky decision making settings. Students will learn how to test the predictions of choice models, fit the models on behavioral data, and quantitatively examine the goodness-of-fit. They will also get practice formulating their own models for describing human behavior.

Classes will be a mix of lecture, discussion, and practical lab work. Class participation will be assessed and will count for 10% of the final grade.

Students will also be required to submit code that they have programmed during class. This code needs to be submitted prior to the start of the subsequent class. The code will be given a binary grade (satisfactory or unsatisfactory) which will then be averaged over the semester to determine another 15% of the final grade.

There are three class projects, all of which require some programming, some writing, and, in the case of project 3, an in class presentation. The bulk of the final grade will depend on these projects, with a 15% weight assigned to project 1, 25% weight assigned to project 2, and 35% weight assigned to project 3.

Students enrolled in Master's or PhD programs at UPenn will have to complete one additional project. The final grade for graduate students will be a weighted sum of the grade on the undergraduate portion of this class (75%) and the grade on the additional graduate project (25%).

There is no explicit requirement for attendance, but if students fail to attend central parts of the course they will score badly on the participation pillar of the grade. Additionally, each class builds on the concepts discussed in the previous classes, so it is imperative that students make sure to make up for any missed material.

Lecture slides, readings, project details, and other relevant material will be posted on Canvas or on the class Google Drive folder. This syllabus may change throughout the semester, and the updated syllabus will be posted on Canvas.

Overview of class topics and relevant deadlines:

Day	Date	Topic
1	8/29	Introduction to Class; Gambles; Expected Value
2	9/5	Mean Variance
3	9/12	Expected Utility and Prospect Theory
4	9/19	Heuristics
5	9/26	NO CLASS
6	10/10	Project 1 Due ; Project 1 Discussion; Model Evaluation
7	10/17	Logit; Mean Squared Error
8	10/24	Maximum Likelihood; Cross Validation
9	10/31	Luce Choice Rule
10	11/7	Project 2 Due ; Project 2 Discussion; Random Errors
11	11/14	Context Effects
12	11/21	NO CLASS [we have will have small group meetings instead]
13	11/26*	Project 3 Workshop
14	12/5	Project 3 Due ; Project 3 Presentations

**This class is on Tuesday instead of Thursday due to Thanksgiving scheduling*