Philosophy 12: Introduction to Causal Reasoning

Tu Th 11:10–12:30, YORK 2622

Course Description

We use causal reasoning all the time. For example, we think that the hot water and red sock *caused* the white shirt to turn pink. Or the cold air *caused* the lake to freeze over. But what do we mean by these sorts of claims? What other claims are implied by them? When are we justifed in making one of these claims? How do social scientists prove causal claims when they can't do experiments?

This course provides an introduction to causal reasoning. We begin by considering the nature of causation and ways to represent causal claims. We will focus on simple statistical claims involving the frequencies of properties, such as having a college education, and associations, such as whether earning a high income is more frequent among those with a college education. One central question concerns the connection between causal claims and statistical claims. We will finish with a discussion of how several problems in scientific inquiry (and their solutions) naturally emerge from this framework.

Contact information

Instructor	Jason Alexander
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Office Hours	Tuesday and Thursday 1–2

Teaching Assistants

Eirik Harris	`eiharris@sdcc3.ucsd.edu`
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Texts

There is no textbook for this course. Lecture notes may be purchased at Soft Reserves or, alternatively, may be downloaded from the course web page at `http://iacs5.ucsd.edu/~pi12x` (the freely available Adobe Acrobat reader is required to view the downloaded files).

Grading Policy

Your grade will be determined as follows:

First Midterm	20%
Second Midterm	20%
Final	45%
Quizzes (or module completion for on-line students, see below)	15%

Students taking the class P/NP must still take both midterms and the final exam

The quizzes will only be given in discussion section in the weeks indicated below. There will be eight quizzes in all. Only your best six quizzes count towards your final grade, so that quizzes missed due to illness or other circumstances do not have to be made up. Each week, the quiz will be open book and will cover the *previous* week's lecture material. Cheating on any tests will not be tolerated; anyone caught cheating will fail the course.

Online lectures

Approximately half of the class will take the course through web-based software that has been developed specifically for this course. Students taking the web version will not attend lecture, nor take weekly quizzes, but they will be required to attend discussion section. Students in the online course will work through the material on the web at the same pace as the lectures. The only classes the web-based students will be required to attend are the two in-class midterms and final exam.

Computers for students taking the online version of the course are available at CLICS, located in Galbraith Hall, and we can also tell you how to set up a personal computer, if you would rather not go to CLICS. We also guarantee that, *as a group*, students taking the course over the web will do at least as well as the students attending lectures and discussion sections. To ensure that no one falls behind, students taking the course via the web need to complete the specified modules for each week by Monday, 7:00 p.m., of the following week. They must score at least 60% on the module quiz to receive credit for that module (1% per module).

On the pre-test given during the first day of class, you will have the opportunity to sign up for the web-based course. Not all students will be able to take the course this way; we have limited resources, and so may need to randomly choose from the volunteers. Students taking the web-based course will be notified by email by Tuesday evening. To summarize, the students in the web-based course do not have to attend lecture, can work on their own schedule, and are guaranteed (as a group) not to do worse than the lecture students (as a group). Students in the lecture-based course will take weekly quizzes in discussion section. All students must take the (in-class) midterms and final.

Lecture/Module Schedule

Week 1
4/3 Introductory lecture
4/5 Event Causation

Week 2
4/10 Variable Causation
4/12 Indeterministic Causation

Week 3 (Quiz in discussion sections)
4/17 Causal Graphs
4/19 Interventions

Week 4 (Quiz in discussion sections)
4/24 Midterm #1
4/26 Relative Frequency

Week 5 (Quiz in discussion sections)
5/1 Conditional Relative Frequency
5/3 Independence

Week 6 (Quiz in discussion sections)
5/8 Conditional Independence
5/10 Causation vs. Association

Week 7 (Quiz in discussion sections)
5/15 Midterm #2
5/17 Causation to Unconditional Association

Week 8 (Quiz in discussion sections)
5/22 Causation to Conditional Association
5/24 D-Separation

Week 9 (Quiz in discussion sections)
5/29 Causal Discovery
5/31 Confounding

Week 10 (Quiz in discussion sections)
6/5 Experiments
6/7 Review

6/12 Final exam, 11:30–2:30