Philosophy 109: Intro to Formal Reasoning and Decision Making

Spring 2019

**Class Meetings:** Online

**Instructor**: David Sorensen

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Skype office hours: 2:30-3:30 T/TH

**Course Description:** In this course, we will learn how to identify and construct valid arguments, strong inductive inferences, and how to make rational decisions under uncertainty. No previous exposure to philosophy or formal methods will be necessary. We will begin by studying the fundamentals of probability theory, as well as some more advanced concepts (e.g. Bayes’ theorem). We will then apply our newly acquired conceptual tools to real world cases, ranging from game shows to scientific research. Lastly, we will look at recent empirical work—from the field of behavioral economics—to understand how decisions are routinely affected by cognitive biases and other errors in reasoning.

**Core Curriculum Goals: QQ or QR**

The course meets core curriculum goals QQ (Formulate, evaluate, and communicate conclusions and inferences from quantitative information) and QR (Apply effective and efficient mathematical or other formal processes to reason and to solve problems).



**Readings:**

All readings will be made available on Canvas (no physical textbooks required)

*An introduction to inductive logic* by Ian Hacking

*A concise introduction to logic* by Patrick Hurley

*Thinking Fast and Slow* by Daniel Kahneman

**II. Format and Procedures:**

All of the course content and assignments will be on Canvas. There will be one module for each week (excluding Spring break). The first module will open January 21st at 12am. For each module, you read at least one chapter from the textbooks, complete a set of problems, and complete a quiz. Quizzes will be primarily based on video lectures and powerpoint slides. There will also be a midterm and a final exam (cumulative).

**Problem sets**: Each week, I will post a selection of questions for you to answer (usually from one of the textbooks). You will submit answers to all of the questions through Canvas (no emails!) before the specified deadline. Late work will not be accepted.

**Discussion posts:** Each week, you will be asked to complete and submit a short assignment to the discussion thread. Examples of assignments include: short essays, small research projects, and drawing connections between the concepts learned in class to the real world.

**Exams**: Exams will consist of 15 multiple choice and 10 fill in the blank questions (25 questions total). The questions will be like those found in the problem sets.

The first two exams will be made available on Canvas. The final exam will be held on campus (time and location TBA).

**Policy on submitting work:** Work needs to be submitted on time through Canvas. I will not accept late work by email. Please contact me asap if you have any problems or concerns.

**Grade breakdown**

|  |  |
| --- | --- |
| Quizzes | 10%  |
| Discussion posts | 10% |
| Problem sets  | 20% |
| Exam I  | 20% |
| Exam II | 20% |
| Final Exam  | 20% |

**Schedule at a glance**

Week 1: Introduction to formal logic
Week 2: Invalidity and logical fallacies

Week 3: Inductive logic and Probability

Week 4: Probability II

Week 5: Probability III: Bayes theorem

Week 6: Problems and puzzles (Monty Hall & Mosteller Hall)

Week 7: Causality: Mill’s five methods

Week 8: Statistical reasoning

Week 9: Hypothetical/scientific reasoning

Week 10: Legal and moral reasoning

Week 11: Thinking fast and slow

Week 12: Heuristics and biases

Week 13: Overconfidence
Week 14: Choices

**Academic Integrity**:

<http://academicintegrity.rutgers.edu/academic-integrity-policy/>

Violations include: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating violations of academic integrity.

**Plagiarism Tutorials:**

*The Camden Plagiarism Tutorial (INTERACTIVE):*

[*http://library.camden.rutgers.edu/EducationalModules/Plagiarism/*](http://library.camden.rutgers.edu/EducationalModules/Plagiarism/)

*Consult Don't Plagiarize: Document Your Research! For tips about how to take notes so that you don't plagiarize by accident.* [*http://www.libraries.rutgers.edu/avoid\_plagiarism*](http://www.libraries.rutgers.edu/avoid_plagiarism)

**Additional Resources:** [*http://academicintegrity.rutgers.edu/resources-for-students*](http://academicintegrity.rutgers.edu/resources-for-students)

**Student-Wellness Services:**

[**Just In Case Web App**](http://m.appcreatorpro.com/m/rutgers/fda9f59ca5/fda9f59ca5.html)

<http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

**Counseling, ADAP & Psychiatric Services (CAPS)**

**(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/** [**www.rhscaps.rutgers.edu/**](http://www.rhscaps.rutgers.edu/)

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students’ efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

**Violence Prevention & Victim Assistance (VPVA)**

**(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 /** [**www.vpva.rutgers.edu/**](http://www.vpva.rutgers.edu/)

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

**Disability Services**

 (**848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 /** [**https://ods.rutgers.edu/**](https://ods.rutgers.edu/)

The Office of Disability Services works with students with a documented disability to determine the eligibility of reasonable accommodations, facilitates and coordinates those accommodations when applicable, and lastly engages with the Rutgers community at large to provide and connect students to appropriate resources.

**Scarlet Listeners**

**(732) 247-5555 /** [**http://www.scarletlisteners.com/**](http://www.scarletlisteners.com/)

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.