

Introduction to Formal Reasoning and Decision Making

Philosophy 109
Section H1, Summer 2020

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Lecture: Online

Office Hours: by arrangement

Course Description. “Fundamentals of logical, probabilistic, and statistical thinking, as well as the basic principles of rational decision making. Reasoning through data (and rhetoric) encountered on a daily basis using elementary principles of deductive logic and inference.”

Resolving differences of opinion isn't always impossible. Figuring out what you should believe isn't just a matter of checking what's true. Deciding what you should do doesn't have to be left up to your whim. Formal tools have been (and continue to be) developed that enable us to talk very precisely about the strength of arguments and of evidence, the rationality of beliefs we have, and the value of choices we make.

This course will introduce students to some of those formal tools and their applications to formal reasoning and decision making: Sentential Logic will be used as a model for expressing ourselves carefully and judging deductive arguments. Probability and Statistics serve as tools for making inductive inferences, evaluating evidence, and quantifying risk and uncertainty. Decision Theory and Game Theory will provide methods that employ those logical and probabilistic tools in order to help guide our decision making. For all of these, we will also discuss their peculiarities, limits to their application, and their potential for expansion and sophistication.

Core Curriculum Learning Goals. Please note that this course satisfies the SAS Core Quantitative and Formal Reasoning learning goals

(QQ) Formulate, evaluate, and communicate conclusions and inferences from quantitative information.

(QR) Apply effective and efficient mathematical or other formal processes to reason and to solve problems.

This is a Philosophy course, so the qualitative conceptual foundations and implications of the mathematics discussed will constitute a significant portion of the course material on which you are evaluated. However, quantitative mathematical skills themselves will play no less of a role in the course material and evaluation. It is assumed that you have some basic mathematical skills (especially algebra and fractions), and success in this course depends heavily on the *kind* of thinking that one has to do in math classes.

If you are concerned about the math content of this course or whether you are prepared for it, please discuss the matter with the instructor as soon as possible.

Course Materials. We will be working exclusively from notes provided by the instructor that will be made available through the course website.

Course Website. The course website is done through Canvas, and is available directly at [TBA]. It is expected that you turn on alerts for announcements made on the course site so that you can stay up-to-date on any changes to the course.

Accessibility and Accommodations. Any needed accommodations or issues that might affect your academic performance should be brought to the attention of the instructor as soon as possible. Consult with the instructor or any of the following offices for help or more information:

- [Academic Advising](#)
- [Student Health and Counseling](#),
- [Office of Disability Services](#)
- [Violence Prevention and Victim Assistance](#)
- [Scarlet Listeners](#)

Student Conduct. You should make sure you are familiar with the rules regarding proper academic conduct as detailed at the [Student Affairs' Academic Integrity website](#). Additional information regarding student conduct in general is available at the [Office of Student Conduct website](#).

Assessment. The course is divided into three units—*Logic, Probability, and Decisions*—and eleven topics (four each in the first two units, and three in the third unit) that correspond with single chapters in the notes. Assessment will be based on a mixture of exams, quizzes, and participation in both live meetings and asynchronous online discussions.

Each of the three units of the course will end with an exam worth 15% of the course grade. A comprehensive final exam will be worth 15% of the course grade. The lowest exam grade will be dropped, for a total of 45% of the course grade coming from exams. This means that if you do poorly on an exam, you can make up for it with the final, or, if you are happy with your grade going into the final, you can skip it. Each exam will be accessible for a 24 hour window and be proctored by **Proctortrack** (see below for more information).

There will be 11 online quizzes (one for each chapter/topic), each worth 2.5% of the course grade. Each quiz may be taken twice, with the higher score being retained. The lowest of the 11 (retained) quiz grades will be dropped, for a total of 25% of the course grade. Quizzes will have set due dates and will incur a 10% lateness penalty per day late. Each quiz will be accessible for at least a week. Like exams, quizzes will be proctored by Proctortrack.

There will be 11 asynchronous online discussion assignments (one for each chapter/topic) conducted through **Perusall** (see below for more information). These will each be worth 2% of the course grade, and the lowest scoring discussion will be dropped, for a total 20% of the course grade being based on discussion posts.

There will be several live meetings per week (exact details depend will depend on student schedules) held on Canvas' Conferences platform. Students are expected to

participate in at least one meeting per week during the five full weeks of the course, and each week of participation will be worth 2% of the course grade, for a total of 10% of the course grade being based on live meeting participation.

In short:

20% — 10 Discussions at 2% each (best of 11)

25% — 10 Quizzes at 2.5% each (best of 11)

10% — 5 Live Meetings at 2% each (at least one per week)

45% — 3 Exams at 15% each (best of 3 Unit Exams and 1 Comprehensive Final)

Extra Credit. The “best of” structure to the course’s grading makes the last discussion posts, the last quiz, and the comprehensive final exam function as extra credit. Please do not ask for additional extra credit. Alternative assessments will be offered only as warranted by documented accessibility and accommodation requirements.

Proctortrack. Quizzes and exams in this course will require the use of Proctortrack software, a remote proctoring service. No extra fees are associated with use of Proctortrack. You will need a web camera and a desktop or laptop computer. Mobile devices cannot be used.

You will have to set up your Proctortrack account profile by taking an ungraded “onboarding” quiz. This quiz is intended to identify any potential software problems. It must be done before any proctored quizzes or exams are taken, but it only needs to be done once.

Additional information and support can be found on the course site and below.

- [Proctortrack Technical Requirements](#)
- [Proctortrack FAQs](#)
- [Proctortrack Canvas Student User Manual](#)
- [Proctortrack Tech Support](#) (also by phone: 844-753-2020)

Schedule. Below is a tentative schedule for the course. Assignments are listed on the day they are due.

Note that August 12—the Wednesday of our 6th week—is the last day of our class and the entire summer session. All course material must be submitted by August 12 without exception.

July 6 *first day of class*

- **Logic**

July 9 Chapter 1 Discussion & Quiz

July 12 Chapter 2 Discussion & Quiz

July 15 Chapter 3 Discussion & Quiz

July 18 Chapter 4 Discussion & Quiz

July 19 Exam 1

- **Probability**

July 22 Chapter 5 Discussion & Quiz

July 25 Chapter 6 Discussion & Quiz

July 28 Chapter 7 Discussion & Quiz

July 31 Chapter 8 Discussion & Quiz

August 1 Exam 2

- **Decisions**

August 4 Chapter 9 Discussion & Quiz

August 7 Chapter 10 Discussion & Quiz

August 9 Chapter 11 Discussion & Quiz

August 10 Exam 2

- **Final**

August 12 Comprehensive Final & *last day of class*