LOGIC 2:
LGIC 3200 / PHIL 4722 / MATH 5710 / PHIL 6722

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Schedule: This class meets Tθ 3:30-5 in Williams 216.

Office Hours:
Two hours weekly to be determined, and by appointment.

Topics: We will cover a variety of topics in model theory, highlighting connections to combinatorics and algebra. We will start with an exploration of quantifier elimination in a number of classic theories. We will then dive deeper into the model theory of real closed fields (such as $\mathbb{R}$) in particular, generalizing to o-minimal structures, covering properties such as o-minimal cell decomposition. There are then several topics which we can pursue, depending on time and interest, such as

- Pregeometries/matroids/dimension in strongly minimal and o-minimal structures
- Semialgebraic incidence combinatorics and distal cell decompositions
- NIP, VC-dimension and connections with statistical learning theory.

Texts: I will be using a variety of sources for this class, so the authoritative source for lecture materials will be my lecture notes, posted on the course The main source for the first part of the class will be *Model Theory: An Introduction* by Marker, which should be available on SpringerLink through Penn. I may assign some homework problems from Marker - if you have trouble accessing it, email me. A list of additional texts will be updated on the course website.
Grading: Students will be graded either on presentations or homework. Undergraduate students should enroll in LGIC 3200 or PHIL 4722 to be graded on homework, while graduate students should enroll in MATH 5710 or PHIL 6722 to be graded on presentations.

Homework: Students enrolled in LGIC 3200 / PHIL 4722 will be graded on biweekly homework. Homeworks will be posted here, and are to be submitted on Gradescope. The Gradescope course, hosted at https://www.gradescope.com/courses/1209753 will require an access code, for which you can email awanders@sas.upenn.edu.
Students are not to use large language models (colloquially AI, for instance, ChatGPT) as part of working on their homeworks without explicit instructor permission. Even after obtaining instructor permission, all insights obtained this way must be cited.

Presentations: Students enrolled in MATH 5710 / PHIL 6722 will be graded on giving a presentation.
One 45-minute in-class seminar presentation will suffice to meet the presentation requirement. Presentations can be on any relevant research paper or similar topic with instructor approval. The course website will have a list of recommended papers.