

## PMATH 930 – Winter 2021

### Topics in Logic: Model theory of difference fields

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*Remote learning.* Despite early hopes, this course is now going to be entirely online. Lecture videos, intended to be viewed like you would listen to a lecture in class, will be posted on LEARN. Office hours will be scheduled on LEARN's Virtual Classroom. Homework assignments will be submitted via Crowdmark.

*Prerequisites:*

- Some model theory – certainly PMATH 433/733 will suffice.
- Commutative algebra, especially fields and polynomial rings.
- Some algebraic geometry, mostly around the Zariski topology on affine algebraic varieties.

*Text:* There will be no text for the course, the lectures will be essentially self contained. Some external sources may be suggested as we go along.

*Evaluation:* I plan for there to be several assignments throughout the term as well as a final oral exam.

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A *difference* field is a field equipped with an endomorphism. The motivating examples come from algebraic dynamics. Over the last 30 years, the model theory of such structures has played a significant role in applications to algebra, geometry, and number theory. This course will be an introduction to the model theory of difference fields with an eye toward these applications.

This course is complementary to PMATH 930 from Fall 2019 where the model theory of *differential fields* were considered. However, the former 930 is neither a prerequisite nor an antirequisite for this course.