

PMATH 930 – Fall 2019

Topics in Logic: Model theory of fields with operators

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MWF 2:30, MC 5479

A *differential* field is a field equipped with a linear operator satisfying the Leibniz rule, while a *difference* field is one equipped with a ring endomorphism. The motivating examples come from algebraic vector fields and algebraic dynamics, respectively. 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 fields equipped with various operators, with an eye toward these applications.

Prerequisites: Some model theory (including consequences of the compactness theorem and quantifier elimination), commutative algebra (especially fields and polynomial rings), and algebraic geometry (mostly around the Zariski topology on affine algebraic varieties) will be prerequisites.

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 (5?) throughout the term as well as a final oral exam.