PMATH 930 – Topics in Logic: Introduction to Universal Algebra
Fall 2021

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Lectures: TR 1:00-2:20
Room: MC 4042
First lecture: Thursday Sept 9
Webpage: On LEARN

This is a first course in universal algebra, which is the general study of algebraic systems and their equational theories. I will generally follow Chapters 1 and 2 of Stanley Burris and H.P. Sankappanavar, *A course in Universal Algebra,* Springer, 1981, which can be downloaded at http://www.math.uwaterloo.ca/~snburris/htdocs/ualg.html (use the corrected 2012 version). However I will use (and insist that students use) modern notation such as that found in Clifford Bergman, *Universal Algebra*, CRC Press, 2012.

Topics:

- Lattices and closure operators
- Algebras, subalgebras, congruences and quotient algebras, homomorphisms, products
- Subdirect representations, subdirectly irreducible algebras
- Varieties
- Terms, free algebras, identities, Birkhoff's Theorem
- Maltsev conditions
- Equational logic
- Abelian congruences and centrality (time permitting).

There will be significant biweekly assignments, and a final "capstone" assignment, similar in format to a 48-hour take-home exam to be completed during the examination period.