MATH 658: Schemes and Sheaves
Mondays and Wednesdays 9-10:30 am
205 LOM

Instructor: Sam Payne, DL 414, sam.payne@yale.edu

Principal Readings:

- *Foundations of Algebraic Geometry* Ravi Vakil
- *Algebraic Geometry* Robin Hartshorne

Prerequisites: Commutative algebra at the level of Math 380/381 or 500/501.

Course Overview: This course is an introduction to the modern language of algebraic geometry and its basic technical tools: schemes and sheaves. This language pervades a great deal of modern mathematics, and is now fundamental to algebraic number theory, geometric representation theory, and some aspects of homotopy theory as well as K-theory and algebraic geometry. We will largely follow Ravi Vakil's new text *Foundations of Algebraic Geometry*.

Homework: There will be extensive weekly problem sets, mostly drawn from the course texts. These will be assigned and collected on Wednesdays. Solutions to the homework problems should be written carefully and presented clearly. Students are encouraged to work together, use all available texts and online resources, and discuss the problems with each other or other members of the math department until they have arrived at a satisfactory understanding, but must write their own solutions.

Grading: Grades for the course will be based on the weekly problem sets.