

MATH 631: ALGEBRAIC GEOMETRY I (FALL 2024)

COURSE INFORMATION

Lectures: TR 11:30am-1pm in EH 1084

Lecturer: Aaron Pixton

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Office Hours: M 10am-11am (EH 3842), W 8pm-9pm (Zoom: <https://umich.zoom.us/j/4351078600>), F 4pm-5pm (EH 3842), or by appointment

COURSE WEBSITE

The main course website is at <http://websites.umich.edu/~pixton/631/>.

COURSE DESCRIPTION

This course will introduce the basic notions and objects of modern algebraic geometry from a scheme-theoretic perspective. We will be (loosely) following Ravi Vakil's notes "Foundations of Algebraic Geometry" (available at <http://math.stanford.edu/~vakil/216blog/index.html>). We will cover most of Chapters 2-13 this term.

PREREQUISITES

The most essential things to know for this class are basic ring/module theory (prime ideals, localization, tensor product of algebras) and some topology (open covers, bases, etc). It will also be helpful to have some familiarity with basic category theory (see Chapter 1 of Vakil's notes).

PROBLEM SETS

There will be weekly problem sets, usually posted on the course website on Thursday afternoons (beginning Sep 5) and due on the following Thursday. Problem sets should be submitted on Gradescope (access via Canvas).

You are encouraged to discuss the problems with your classmates, but you must write up your solutions independently. You must also include a written acknowledgment of everyone you worked with in your assignments, as well as any external sources you consulted (e.g. Hartshorne's book). External sources here includes LLMs (e.g. ChatGPT) - you are allowed to consult these if you want, but I don't recommend them for anything related to algebraic geometry. (But if you do find a good use for them, I would like to know about it!)

There will be no exams; your final grade will be based on the problem sets.

OFFICE HOURS

My current weekly office hours are M 10am-11am (EH 3842), W 8-9pm (Zoom: <https://umich.zoom.us/j/4351078600>), F 4-5pm (EH 3842). You are also welcome to contact me to schedule an alternative meeting time.