Here are some of the **topics** we will cover, in more detail: affine and projective varieties, Hilbert's Nullstellensatz, tangent spaces, smoothness, dimension theory, morphisms and rational maps, Grassmannians, correspondences, blow-ups, degree, Bezout's theorem, Hilbert polynomial, divisors and linear systems on curves, the Riemann-Roch theorem.

I will assume familiarity with basic algebra (fields, rings, modules, polynomial rings) as in Math 123 or an equivalent class. It will also be useful to know a minimal amount of commutative algebra (e.g. prime and maximal ideals, Noetherian rings) as in Ch.1 of Atiyah-MacDonald.

There is no textbook for the course, but I will consult a number of standard sources, like R. Hartshorne's "Algebraic Geometry", I. Shafarevich's "Basic Algebraic Geometry I", J. Harris' "Algebraic Geometry" or W. Fulton's "Algebraic Curves" available for free (legally) here. Occasionally it may be helpful to consult commutative algebra texts, like M. Atiyah and I. G. MacDonald's "Introduction to Commutative Algebra", or D. Eisenbud's "Commutative Algebra with a view toward Algebraic Geometry".

These notes from Mihnea Popa's CA's during Spring 2023 might also be helpful, but be wary of mistakes. Math_137_Notes___Spring_2023.pdf

Math 137 Notes.pdf

Course structure:

We will meet in person on Monday and Wednesday, 9-10:15 AM in SC 222.

Regular attendance is expected. There will be weekly homework, posted on Canvas and on this page every Friday, and due the following Friday. Homework is the most important component of this course, counting for 60% of your grade. Normally no late homework will be accepted, but the lowest score will be dropped. You are encouraged to collaborate on the homework problems, but you must write your own solutions and properly acknowledge any collaboration, or help you receive from others. There will also be a take-home final exam that will account for 40% of the final grade.

Office hours:

Austin SC 242h Wednesday after class until noon, Friday 9am - 10:30am, and by appointment

Jarell math lounge Tuesday 6pm-7pm