Math 1025: Geometry and Art

This class is about incidence geometry and projective geometry: how lines and planes intersect, and how to add points to euclidean spaces (the familiar R^2, R^3, etc.) to obtain a space that include points and lines at infinity. It's also about art, and how classical artists used projective geometry, sometimes without knowling they were doing so, to create perspective drawings that render three-dimensional space on a canvas in a way our eyes intuitively understand.

The projective geometry content will be at times pretty mathy. We use axiom systems, figure out what's true about them, prove theorems, and construct abstract spaces that are models for the axioms.

The applications to art will be very hands-on. Expect to sketch a lot, to draw lines on existing pieces of art or sample drawings, and to look at physical objects and attempt to capture them in perspective drawings.

If you think of yourself as a bad artist (as I do) it shouldn't matter: we're all going to take a major step forward in one technical aspect of art, namely how to get the lines right in perspective drawings. If you have no real math background, or are even a bit math-phobic, that shouldn't matter either. No math background beyond algebra and trigonometry is necessary. All that is required is willingness to try your hand at logic, to learn the structure of mathematical argument, and to harness your geometric intuition.

Required text: Cranell, Frantz and Futamura, "Perspective and Projective Geometry".