

**MATH 312A - GEOMETRY
FALL 2007**

TTH: 1:10 - 2:30 P.M. (HATHORN 100)

Syllabus:

- Parameterized curves in \mathbb{R}^2 and in \mathbb{R}^3
 - arc length, curvature, Frenét formulas
- Parameterized surfaces in \mathbb{R}^3
 - normal and tangent vectors, Gaussian curvature
- Euclidean isometries
 - isometries in \mathbb{R}^2
 - translations, rotations, reflections, and glide reflections
 - isometries as products of reflections
- Symmetries
 - frieze patterns, wallpaper designs
 - groups of symmetries
 - tessellations: regular and semi-regular
- Planar graphs
 - Euler's formula
- Solids
 - Euler's formula and classification of regular solids, golden ratio
- Hyperbolic Geometry
 - upper half plane model
 - linear fractional transformations
- Miscellany
 - rubber sheet geometry: cut and paste topology