Math 380: Creating Mathematical Visuals & Interactive Animations

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Special Topics Course Proposal

Course Description

This course focuses on creating clear, interactive mathematical visuals and animations, with particular emphasis on parametric curves, motion, vectors, surfaces, and parametric surfaces. Using Desmos (2D and 3D) as the primary tool, students design models that make abstract ideas visible, dynamic, and explorable.

Learning Goals

- Create accurate parametric curves and animations
- Model motion using time-dependent variables and vectors
- Visualize surfaces and parametric surfaces in 3D
- Apply effective labeling and visual design
- Communicate mathematical ideas clearly to non-expert audiences

Core Mathematical Themes

- Parametric curves and motion
- Vectors and velocity
- Curves on surfaces
- Parametric surfaces
- Labeling and annotation

Assessment

Assessment is portfolio-based and emphasizes clarity, correctness, revision, and communication. There are no timed exams.

Intended Audience

Math majors and minors, future teachers or tutors, and students with precalculus or calculus experience.

Rationale

Visualization is a mathematical skill. By emphasizing motion, vectors, and surfaces, this course helps students build intuition while learning to communicate mathematics clearly.