OBJECTIVES: Students will gain familiarity and facility with visual, computational, and various quantitative and qualitative approaches to analyzing environmental problems, including the mathematical maturity and quantitative literacy skills for asking new questions and evaluating the broader context into which these and other environmental algebra questions fit.

INTENDED FOR: Liberal Arts and Environmental majors.

PREREQUISITES: Three years of high-school mathematics, including Algebra II, or intermediate algebra at a college (e.g. Math 100).

TEXT: No text; handouts, articles and other readings will be distributed and assigned.

INTRODUCTION: Overview of Mathematical Modeling and quantitative literacy. Preview: Algebraic models; models with instantaneous rates; Questioning models/assumptions and how not to lose the forest for the trees

Introduction to Models and Modeling
Linear, quadratic, exponential and other models

A Quick Introduction to Instantaneous Rates of Change
Modeling Instantaneous Rates of Change

Models Using Instantaneous Rates
Contexts, properties, techniques, and specific applications

Resource Depletion, Pollution and Their Interaction
Hubbert's Peak and other peaks; climate change; what Mathematics does and doesn't tell us about the answers, and how well-defined questions are

Miscellaneous Topics
May include: Mathematical Logic and other quantitative tools for evaluating arguments; The exponential function revisited; difference equations; probability; energy analysis; and/or other topics per student interest

Projects
Discussion, in-class mini-projects, and group or individual presentations of capstone projects

EVALUATION
Class Participation, Homework, and Quizzes 20-30%
Test/Preliminary Projects 10-25%
Capstone Project and Presentation 15-30%
Mathematics Journal 15-25%
Final Exam 15-25%

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