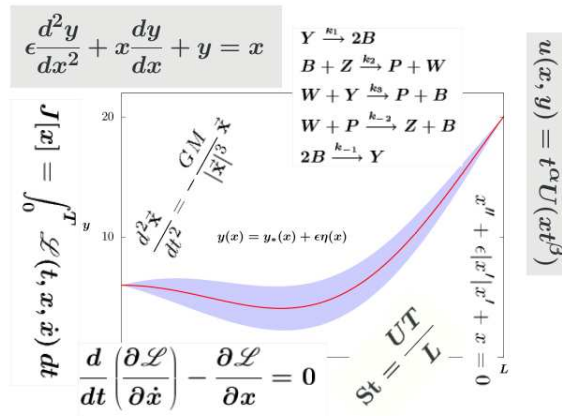


MATH 577: Mathematical Modeling



Spring 2024 [5178]

Prof. Thomas Witelski

Wed, Fri 1:25-2:40 pm Room 235 Physics Bldg

<http://www.math.duke.edu/~witelski/577>

A course on analytical methods for math models for students in applied math, engineering, and the applied sciences

Applications:

- Mechanical systems, control theory
- Continuum mechanics, heat transfer, fluid flow
- Bio-chemical reactions

Mathematical methods:

- Dimensional analysis, non-dimensionalization
- Similarity solutions, traveling waves
- Perturbations methods, boundary layers, multiple-scales
- Calculus of variations

Prerequisites:

Undergraduate-level background in ordinary differential equations (Math 353 or 356), basic physics (mechanics), and multi-variable calculus.

Textbook: *Applied Mathematics*, J. D. Logan, 4th edition, 2013.

