

Introduction to Mathematical Modeling

Spring 2024 tentative schedule

The following (preliminary) schedule serves as a guideline for the sections covered in the lecture.

Math UA 251 Section 004 Schedule		
Week	Date	Topic
1	Mon, Jan 22nd Wed, Jan 24th	Fibonacci Numbers, the Golden Ratio, and Laws of Nature? Phyllotaxis Predator-prey model
2	Mon, Jan 29th Wed, Jan 31st	Predator-prey model & Simple harmonic oscillator Simple harmonic oscillator & Flows on the circle: synchronization, fireflies, neurons
3	Mon, Feb 5th Wed, Feb 7th	Flows on the circle: synchronization, fireflies, neurons Models for thin structures
4	Mon, Feb 12th Wed, Feb 14th	Beam buckling Collapsing Bridges: Tacoma Narrows
5	Mon, Feb 19th Wed, Feb 21st	— <i>President's Day (no class)</i> — Angular momentum and torque
6	Mon, Feb 26th Wed, Feb 28th	Conservation of angular momentum, Kepler's 2nd law, and planetary motion Data-driven modeling: discovery of dynamical systems from data
7	Mon, Mar 4th Wed, Mar 6th	Data-driven modeling: discovery of dynamical systems from data Midterm exam
8	Mon, Mar 11th Wed, Mar 13th	Traffic models Traffic models
9	Mon, Mar 18th Wed, Mar 20th	— <i>Spring Break (no class)</i> — — <i>Spring Break (no class)</i> —
10	Mon, Mar 25th Wed, Mar 27th	Some probability problems and paradoxes Some probability problems
11	Mon, Apr 1st Wed, Apr 3rd	The mathematics of voting, power, and sharing The mathematics of voting, power, and sharing
12	Mon, Apr 8th Wed, Apr 10th	Vortex motion Vortex motion
13	Mon, Apr 15th Wed, Apr 17th	Vortex motion Introduction to MATLAB
14	Mon, Apr 22nd Wed, Apr 24th	Introduction to MATLAB Control theory
15	Mon, Apr 29th Wed, May 1st	Optimal control Presentation of final projects
16	Mon, May 6th	Presentation of final projects