MATH 146

Current Problems in Applied Mathematics:

Dynamical Systems and Data Science

Lecture Plan

Week 1	Introduction; measure-preserving dynamical systems; ergodic theorems
Week 2	Koopman operators; spectral characterization of mixing and ergodicity
Week 3	Forecasting; construction of data-driven bases
Week 4	Kernel integral operators
Week 5	Reproducing kernel Hilbert spaces; conditional expectation of observables
Week 6	Spectral analysis of Koopman operators: Systems with pure point spectrum
Week 7	Spectral analysis of Koopman operators: Continuous spectrum
Week 8	Data assimilation
Week 9	Student presentations