

Syllabus, MATH4780/6780 (cross-listed with ENGR 8980)

Instructor: Andrew Sornborger

Lecture Hours: Tuesday and Thursday, 11:00am to 12:15pm

Text: A Course in Mathematical Biology, Quantitative Modeling with Mathematical and Computational Methods. by de Vries, Hillen, Lewis, Müller, Schönfisch.

Homeworks: Weekly.

Office Hours: decided by class and instructor's schedules.

Topics Covered:

- 1) Discrete-time Models: One- and Multiple-dimensions (mostly Two-dimensions), Linear stability analysis, Numerical methods, Population genetics.
- 2) Ordinary Differential Equation Models: One- and Multiple-dimensions, Linear stability analysis, Bifurcations, Numerical methods, Reaction kinetics, Population models, Epidemics.
- 3) Partial Differential Equation Models: Partial derivatives, Numerical methods, Age structure, Reaction-diffusion equations.
- 4) (If we get this far) Stochastic Differential Equations: Markov chains, Numerical methods, Forest ecosystems.