

PSC 403 MATHEMATICAL MODELING

Fall, 1998  
T, Th 9:40-10:55  
Hylan 307

Professor: John Duggan  
Office: Harkness 320b, x34999  
Hours: T, Th 1:30-3:00

My goal in this course is to give you enough math to prepare you for empirical/applied research in political science or, if it is your cup of tea, to give you adequate background for more advanced studies of formal methods. Homeworks and a final will be designed to develop your ability to reason mathematically as well as your problem-solving skills. There are two textbooks for the course.

- Simon and Blume, *Mathematics for Economists*
- Binmore, *Mathematical Analysis*

An outline of the topics to be covered is as follows. Bonus topics, as the name suggests, will be covered only if time permits.

1. Preliminaries
  - (a) logic
  - (b) sets, relations, functions
2. The Real Line
  - (a) convergence, continuity, etc.
  - (b) differentiability
  - (c) optimization
  - (d) Riemann integration
3. Finite-dimensional Euclidean Space
  - (a) vectors, matrices, etc.
  - (b) convergence, continuity, etc.
  - (c) differentiability

- (d) optimization
- (e) iterated integrals

4. Bonus Topics

- (a) correspondences, theorem of maximum
- (b) fixed point theorems
- (c) Lebesgue integration
- (d) differential equations