MATH 346 COURSE OUTLINE (Tentative)

All Math- 346 lectures cover the topics by text: "Course in Mathematical Biology Qualitative Modelling with Mathematical and Computational Methods" G. de Vries et al, 2006:

Week 1

- §1.1 The Modeling Process
- §2.1 Discrete-Time Models
- §2.2.1 Growth Models

Week 2

- § 2.2.2 Linear Stability Analysis and Cob webbing
- §2.3 Systems of Discrete-Time Models
- **Assignment #1 Discrete Scalar Models**

Week 3

- §2.3. 2 Linear Stability Analysis and Fixed Points
- §2.3. 4 Host-Parasitoid Models
- 2.2.5 Models in Population Genetics

Week 4

- §3.1-3.2 Review of ODEs
- **Assignment # 2 Discrete Systems Models**
- ***Research Proposal for Individual Project***

Week 5

- Fishery Models
- Bioeconomical Analysis
- §3.3 Systems of ODEs

Week 6

- §3.3.2 Models for Two Populations
- §3.3.3 Basic Epidemic Models
- **Assignment # 3 ODE Scalar Models**

Week 7

- §3.4 Qualitative Analysis of 2 x 2 Systems
- §3.4.3 Lotka-Volterra Models
- Metapopulation Models

Week 8

- §3.7 Elementary Bifurcations
- §3.7.5 The Spruce Budworm Model
- ***Group Project Due***

Week 9

- Marine Protected Areas Models
- **Assignment # 4 Systems of ODEs Models**

Week 10

- §4.1 Partial Derivatives
- § 4.3 Reaction-Diffusion Models
- Turing Patterns in Animal Coat

Week 11

- §5.1-5.2 Stochastic Models. Markov Chains
- §5.2.1 A Two-Tree Forest Ecosystem
- ***Individual Project Due***

Week 12

- § 7.1-7.2 Estimating Parameters
- § 7.3 Model Comparison

Week 13

- Review