BIO 480 Exam 1 Topics

Text readings: Chapters 1 - 3

Intro to models
  What is a model?
  Different forms of models
    Physical vs Abstract
    Empirical vs Mechanistic
    Static vs Dynamic
  Model uses
  Model solutions
    Analytical
    Numerical
  What is a "good" model?
  No programming questions (yet!)

Exponential growth model (Simple population growth model)
  Model description (equation)
  Model solution, initial time and N
  Solution behavior
  Model strengths/weaknesses

The Modeling Process - I
  Basic steps
  Classic approach vs Alternative approach

Logistic growth model
  Density dependent vs density independent models
  Model description
    Carrying capacity
  Solution behavior
    N near zero, N near K, N above K
  Model strengths/weaknesses

The Modeling Process - I
  Model diagrams
    Block diagrams
    Forrester Diagrams
      Basic components
      Example models from Ch 3
    Multiple state variables (multiple compartment models)
    State variable units and dimensional analysis

Predator - Prey Two species model
  Model description (equations), Forrester diagram
    Parameters (r, a, b, d) (meaning, effects)
  Model behavior
  Model weaknesses?

Romeo & Juliet (Two population model)
  Model description (equations)
    Parameters (a, p) (meaning, effects)
  Model behaviors for different values of parameters