Syllabus

1. Introduction

2. Markov model and the Game of Life

3. Single-species Dynamics

a. Continuous-time model

   i.   Exponential model
   ii.   Logistic model

b. Discrete-time model

   i.   Exponential model
   ii.   Logistic model
   iii. Ricker model

c. Individual-based model

4. Two-species Dynamics
   i.   Lotka-Volterra competition model
   ii.   Lotka-Volterra prey-predator model

5. Infectious disease model

   i.   IR
   ii.   IRM
   iii. SIR
   iv. SEIR, SIRS

6. Enzyme kinetics

   i.   Michaelis-Menten dynamics
   ii.   Cooperative substrate binding
   iii. Competitive and non-competitive regulation

7. Modelling natural selection and drift

   i.   Woozleology
   ii.   Wright-Fisher model
   iii. Moran model