Course topics

1. Basic reaction rate theory
   (1) Transition state theory
   (2) Microscopic reversibility (review paper)
   (3) Open systems
   (4) Chemical oscillations
2. Singular perturbation theory
3. An introduction to graph theory
4. An abstract representation of chemical reaction dynamics
5. Analysis of metabolic networks
6. Boolean networks
7. Gene control networks
   (1) Classical DE description (Tyson-Othmer)
   (2) Boolean description
   (3) Mixed descriptions (Glass-Pasternack)
8. Genetic switches and oscillators
9. Stochastic effects and analysis
10. Models
    1.) Signal transduction
        (a) G-protein coupled receptors
        (b) Kinase-coupled
    2.) Cell cycle
    3.) Complex regulatory schemes
    4.) Map K switches – Xenopus