Spring 2019 Course Announcement
School of Public Health: Division of Epidemiology & Biostatistics

PB HLTH 252B Modeling the Dynamics of Infectious Disease Processes (3 units)

Instructor: Dr. John Marshall
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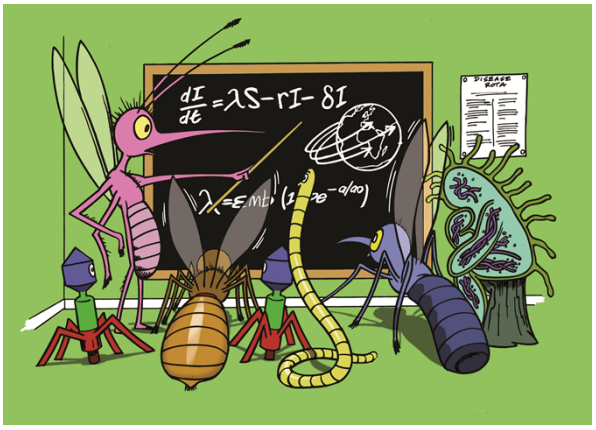
Day/Time: Monday, 2-5pm
First class: January 28, 2019
Location: 110 Barker Hall
Prerequisites: Familiarity with ordinary differential equations and coding in R (functions, loops, etc.)
Software: R, Berkeley Madonna, Excel



Course Description (and scope): In recent years, mathematical models have greatly enhanced our understanding of the epidemiology of infectious diseases, and public health officials have increasingly used models to design effective control strategies. The goal of this course is to lead students through the process of designing mathematical models of diseases, fitting them to data, and using them as public health tools. Examples will be drawn from HIV, influenza, TB, mosquito-borne diseases such as malaria and dengue fever, and recent outbreaks such as Zika, Ebola and SARS.

Each class will consist of a lecture followed by a computer-based activity to apply the lecture material. Students will also work on a project in which they will design their own model and use it to answer a specific research question. The goal of the course is to teach modeling skills to epidemiologists, and so deep mathematical knowledge is not required; however, students should be able to write and interpret ordinary differential equations, and to manipulate code in R. A modeling program called Berkeley Madonna will also be used to code differential equations and will be taught in-class.

Course Material: Recommended reading will be provided weekly.

Upon completion of this course, students will be able to:

- Design compartmental models of infectious diseases
- Understand the role of heterogeneity, especially in sexually-transmitted diseases
- Understand the importance of stochasticity in outbreak modeling
- Estimate the basic reproductive number, R_0, from epidemiological data
- Estimate other parameters, such as the serial interval between a primary and secondary case
- Fit models to incidence and prevalence data
- Incorporate interventions into infectious disease models

For more information, please contact the course instructor (john.marshall@berkeley.edu)