

PB HLTH 252B – Modeling the Dynamics of Infectious Disease Processes Spring 2019

Teacher: John Marshall

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Web site: <http://www.MarshallLab.com>

Class hours: Monday 2-5pm, room: 110 Barker Hall

Office hours: TBD

Texts: [An Introduction to Infectious Disease Modelling](#), by Emilia Vynnycky & Richard White
Additional material to be handed out and/or uploaded to bCourses weekly

Software: [R](#), [Berkeley Madonna](#), [Excel](#)

Grading:	Weekly activities	20%
	Mid-term project presentation & report	30%
	Final project presentation & report	50%

Weekly activities: Weekly activities are designed to reinforce the lecture material and equip students with the practical skills required to carry out the project. Assignments will be published on bCourses by 5pm the Friday before class and relevant material will be covered in class on Monday. Assignments will be due on bCourses by 5pm the Friday after class. They will be graded for completion out of 2, with the top 10 scores each contributing 2% to the final grade.

Project: The goal of the project is to design a model, fit it to data and use it to answer a specific research question. Students may work either as individuals or in pairs on an infectious disease of their choice. Students may either source a data set of their own or use one provided to them. A marking schedule for the project presentations and reports will be provided separately.

Date:	Lecture:	Activity:
Jan 28	Overview, intro to compartmental models	Compartmental model of Ebola
Feb 4	Dynamics of simple models, herd effect	SEIR model in Berkeley Madonna
Feb 11	Heterogeneous behavior, STIs, HIV	Heterogeneity in model of gonorrhoea
Feb 25	Intro to stochastic models	Stochastic model of Ebola
Mar 4	Estimating parameters from incidence data	Parameter estimation for flu outbreak
Mar 11	Estimating parameters from seroprevalence data	Age-dependent FOI for rubella
Mar 18	Outbreak analysis	Parameter estimation for SARS data
Mar 25	<i>Spring break (no class)</i>	
Apr 1	Vector-borne diseases	Ross-Macdonald malaria model in R
Apr 8	Mid-term project presentations	
Apr 15	Intro to MCMC methods	MCMC algorithm in R
Apr 22	MCMC methods for fitting models to data	MCMC model fitting in R
Apr 29	Individual-based models, network models	Individual-based STD model
May 6	ABC, particle MCMC	ABC model fitting in R
May 13	Final project presentations	
TBD	<i>Modeling for public policy (Anna Bershteyn)</i>	<i>IDMOD model for HIV policy</i>