Course Number and Title

ZOO4926-Spring 2019: Outbreaks

Catalog Description

This course will investigate biological and quantitative aspects of emerging pathogens. We will investigate transmission dynamics of infectious diseases during multiple phases of outbreaks. We will review biological, immunological, epidemiological, policy and logistical aspects of outbreaks of emerging pathogens in humans as well as other species. Students will gain familiarity with basic metrics used to quantify transmission dynamics, biological characteristics that contribute to the emergence of pathogens and policy actions taken in response to emerging pathogens.

Credit Hours

3 credit hours

Pre-requisites and Co-requisites

None.

Course Objectives

By the end of the course, the student will be expected to:

- Understand biological factors critical to the emergence of pathogens
- Link appropriate methods with fundamental research questions in infectious disease emergence and epidemics
- Use simple R code to complete a basic data exploration and analysis
- Critically evaluate literature describing biological aspects of pathogen emergence in human, plant and animal systems

Instructor Information

Name: Derek Cummings
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Office hours: by appointment, Carr 422 or Friday afternoon 1:00-3:00 PM

TA Information

Name: Angkana (Hat) Huang
Office location: Carr Hall 422
E-mail address: a.huang@ufl.edu
Office hours: TBD Monday afternoon 1:00-3:00 PM

Course Meeting Time(s)

T, Th period 7 (1:55-2:45)

Course Meeting Location(s)

TBA

Recommended Materials

Textbooks or Other Readings

Readings to be made available

Software (Required)

R, freely distributed at http://www.r-project.org

Course Outline (topics covered by week or by class period)

Week	Topic
1	Introduction to Class
2	Natural history of infectious diseases: In class exercise EBTK: Variance and distributions
3	Intro Virology and Immunology
4	Quantifying pathogen spread Expanding biomedical tool kit: Logarithms and exponential growth
5	Reservoirs of infection and species jumps Stuttering chains of transmission INTRODUCE GROUP PROJECT
6	Characterizing attack rates: serology and detecting pathogens EBTK: Logarithms revisited: Titers and dilutions
7	Models of infectious diseases EBTK: Likelihood, P-values, Differential equations
8	Patterns of transmission: networks Group work
9	Phylogenetics EBTK: Sequencing and sequences
10	Interventions and policy
11	Evaluating a scientific paper EBTK: Confidence intervals
12	Persistence
13	Measuring Burden
14	Complete case study: MERS, Ebola, Chik, Zika, SARS, chosen with input from class
15	In class group work
16	Review or 'catch up' week + poster presentation

*EBTK: Extending your Biomedical Toolkit modules

Attendance Policy

Students are expected to be on time for class. A maximum of 3 absences are allowed.

Conduct in Class

- Please be courteous and do not talk during lecture. This can be distracting to other students and the instructor.
- Only approved electronic devices may be used in class. Approved electronic devices are laptop computers and tablets (when used to take notes or otherwise participate in classroom activities).

Grading

- Homework/quizzes: 5 @ 10 points each (choose top 4 scores, 40% of final grade)
- Final Group Project (joint project): 25% of final grade
- Class Participation: 10% of final grade
- Final Exam: 25% of final grade