

Disease Ecology  
Tentative Course Syllabus  
Summer 2014 – Session 3 – 23 June to 11 July 2014  
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### **Course overview**

Many animal and plant diseases are ecologically complex involving multiple hosts, vectors and parasites or pathogens. Consequently, disease dynamics are influenced by processes at the community, ecosystem and landscape levels. Furthermore, anthropogenic alteration of the environment can affect ecosystem structure and function and therefore disease transmission. The goal of this course is to integrate the fields of ecology, epidemiology, parasitology and traditional disease biology to better understand the occurrence, dynamics and consequences of diseases.

### **Course objectives**

Clearly define epidemiology, parasitology and community ecology terms and principles relevant to disease ecology.

Understand how general epidemiological and ecological concepts and theories apply to disease systems.

Understand how anthropogenic disturbance of ecosystems affects disease dynamics.

Use field and laboratory methods to conduct research and characterize aquatic, terrestrial, animal and plant disease systems.

Communicate research findings via an oral platform presentation and written scientific paper.

### **Required Textbook**

Collinge, S.K., Ray, C. (eds.) 2006. Disease ecology. Oxford University Press, Inc., NY. 227 pp.

### **Optional Textbooks**

Supplemental readings from the primary literature and the following textbooks will be assigned, but purchase of these textbooks is not required:

Ostfeld, R.S., Keesing, F., Eviner, V.T. (eds.) 2008. Infectious disease ecology. Princeton University Press, NJ. 506pp.

Hudson, P.J. (ed.) 2001. The ecology of wildlife diseases. Oxford University Press, Inc. , NY. 197pp.

### **Course format**

The class will meet Monday through Friday from 9:00 am to 4:00 pm (occasionally earlier and later as needed). This course is project-based, lectures will be kept to a minimum, and key concepts and theories will be covered by readings and class discussions. Therefore, expect a fair amount of reading outside of field and laboratory time. The majority of our time will be spent in the field and laboratory studying disease systems. The class will work collectively to plan experiments and collect data for all of the disease systems that are considered. The class will then be divided into smaller teams, with each team being assigned a disease system for which it has to analyze the data, evaluate the results, and share the findings as a platform presentation. In addition, each student will write his or her own scientific research paper based on the team's project. The class will also periodically be taking all-day field trips and hosting guest speakers for an introduction to disease ecology topics of importance in Pennsylvania.

### **Course evaluation**

#### ***Participation (30%)***

Participation will be based on field trip and guest speaker reports, worksheets or exercises; class discussion; and field and laboratory performance.

#### ***Examination (20%)***

One examination on terms, principles, concepts and theories, consisting of definitions, short answers, and long essays to be given about two weeks into the course.

#### ***Platform Presentation (20%)***

One team platform presentation based on a research project to be given at the end of the third week.

#### ***Scientific Paper (30%)***

One individual scientific paper based on the team's research project to be submitted at the end of the third week.

### ***Grading Scale***

The following scale will be used to convert your percentage into a letter grade:

>97%	A+	73-76	C
93-96	A	70-72	C-
90-92	A-	67-69	D+
87-89	B+	63-66	D
83-86	B	60-62	D-
80-82	B-	<59%	F
77-79	C+		

## **Course Policy**

All students are expected to attend and participate in class to enhance their learning. Field and laboratory exercises cannot be made up. Missed collection of laboratory and field data cannot be used in writing the research paper. Late assignments will lose one letter grade per day. This course will abide by the University of Pittsburgh's Academic Integrity guidelines <<http://www.as.pitt.edu/fac/policies/academic-integrity>> and 'Plagiarism Dot ORG's definition of plagiarism <<http://www.plagiarism.org/>>.

## **Disease Ecology Projects**

### ***Possible disease ecology projects include:***

Black-legged ticks and Lyme disease;  
Natural and artificial container-breeding mosquitoes and West Nile virus;  
Schistosomatids and cercarial dermatitis (i.e., swimmer' itch);  
Multiflora rose and rose rosette disease.

## **Field Trips and Guest Speakers**

### ***Possible field trips and guest speakers include:***

White-nose syndrome and bats;  
Rabies and raccoons (western Pennsylvania oral vaccine baiting program);  
Chronic wasting disease and deer;  
Chytridiomycosis and amphibians;  
Black fly suppression program;  
*Fabrella* needle blight of hemlock and beech bark disease.