

# IB 531: Emerging Infectious Diseases and Human Health

## Course Description

This fully online, 8-week course examines new human infectious diseases, such as Asian flu, West Nile virus, AIDS, and Lyme disease that are a major threat to human health as well as re-emerging disease threats due to human activity. The course examines the historic links among human health, disease pathogens, and ecology, as well as the origin of each new disease and how it is regulated by specific environmental conditions. The course explores how global change and biodiversity loss will increase the possibility of future ecological epidemics and the steps needed to reduce their effects on human health. Students will learn about the growing threat of antibiotic resistant bacteria (MRSA and CREs-carbapenem resistant enterobacteriaceae-the "nightmare bacteria"). In addition, the course covers the interesting and fairly new field of the human microbiome and finishes with a look at the reality of future pandemics.

This course is 4 credit hours and does not have any prerequisites. It counts towards one of 5 required biology courses in the Online Master of Science Teaching Biology Program with the School of Integrative Biology.

## Course Objectives

Upon completing this course, students will be able to:

- Describe how disease agents are transmitted, pathogen life cycles, and the underlying factors of disease emergence.
- Illustrate how disease agents can affect species population, ecological communities, and ecosystems, and how this may influence human health.
- Discuss the historical frameworks that influenced the study of disease ecology and the impact on human health.
- Discuss methods of managing ecosystems to reduce the pathogenic load.
- Conclude the course with an overview of diseases that could possibly become an epidemic.
- Explain the ecology of the disease epidemics as examined by the wiki of disease.

## Instructor Information

**Joanne Manaster**

University of Illinois at Urbana-Champaign

## Contact Information

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**Virtual Office Hours:** TBD

## About Me

I've been teaching at the University of Illinois for over 27 years. My specialties are cell and molecular biology with histology being one of my favorite topics. I am especially interested in the medical applications of biology. Prior to online teaching, I coordinated and taught upper level labs for nearly 20 years in the School of Molecular and Cellular Biology and the Department of Bioengineering.

For this program I teach Emerging Infectious Diseases, Human Genome and Bioinformatics and Evolution and Medicine.

## Course Structure

This is a **4-credit hour** course. The course is **8 weeks** long; it consists of 8 content modules. Please be aware that this course is accelerated in nature; 16 weeks' worth of content will be covered in a 8-week time span. You should dedicate approximately **12–16 hours** per week to working on the course itself, but actual time commitments will vary depending on your input, needs, and personal study habits. You are required to log on to the course website a minimum of **4 days per week** but as discussions develop, you will probably need to do so more frequently.

This course is designed with the principles of collaborative learning, constructivism, and active participation in mind. You are encouraged to share your thoughts and engage in problem-solving. The course has a consistent and predictable structure, organized around the modules, with a course website that is straightforward and easy to navigate. Instructions and due dates for activities and assignments are clearly articulated so that you know what is expected of you, and you will be able to easily stay on track.

We realize that you have a life beyond the scope of this course. However, if you are unable to complete an assignment because of professional obligations, you should notify the instructor or, better yet, prepare the assignment ahead of time and post it early. This will give your classmates a head start in reading and responding to your work. Most assignments are due by 11:55 PM of their respective due dates as listed on the course calendar, giving you and your classmates time to read and comment on each other's work before the next module begins.

Assigned readings and responses to discussion questions should be read and submitted during the module for which they are assigned in order to get the most benefit from the discussions. At the end of each content module, participants will have an opportunity to make sure that they have completed all the required activities and assignments.

## Textbooks

There are no formal textbooks for this course. Rather, please refer to the optional books of interest, websites, and e-Reserve information listed in the overview of each weekly module.

## Course Outline

1. Introduction and Epidemiology of Infectious Diseases
2. Population and Community Ecology
3. Biodiversity, Predators, and the Dilution Effect (a special look at Aquatic Ecosystems)
4. Global Change and Disease/Climate Change and Disease
5. Conservation Medicine
6. Ecological Epidemiology
7. Microbial Ecology and the Human Microbiome
8. Disease Re-Emergence and Pandemics

## Course Activities

### Grading Scale

Grade	Points	Percent
A+	679-700	97–100
A	644-678	92–96
A-	630-643	90–91
B+	609-629	87–89
B	574-608	82–86

Grade	Points	Percent
B-	560-573	80–81
C+	539-559	77–79
C	504-538	72–76
C-	490-503	70–71
D+	469-489	67–69
D	434-468	62–66
D-	420-433	60–61
F	0-419	0–59

View the Graduate College Handbook for Students, Faculty and Staff Chapter III: Academic Record [Grading System](#) page for more information.

## Assignments, Weights, and Deliverables

You can access your scores by clicking the **Grades** link from the left column of the course home page.

All interim and final deliverables have due dates. Failure to meet deadlines results in a reduction of the assignment points. For the due dates of each assignment, please see the course calendar.

## Point Distributions

Assignments	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Total points per assignment
<u>Disease of the Week</u>	<a href="#">Select Your DotW Presentation Date</a>								50
Discussion: Initial Post	15	15	15	15	15	15	15	15	120
Discussion: Replies	10	10	10	10	10	10	10	10	80
Quizzes	-	10	10	10	10	10	10	10	70
Wikis	-	40	20	80	40	20	90	-	290
Total									

## Module Overview

Each module will begin with the module overview, explain what the module is about, what learning goals you are expected to achieve, how long the module will take, and in what activities you will participate. Each module is designed with the same structure and activities unless otherwise specified. The module activities are explained in greater detail below. You can find the due dates of specific assignments in the course calendar.

## Muddiest Point

Just before each week's synchronous session, you will let your instructor know what materials are the least clear to you or most in need of additional explanation. Your instructor will then discuss many of the submitted muddiest points during the synchronous session. This is optional and no points are earned for this activity. It is a way to gain clarity on a topic.

## Synchronous Sessions

Each week there will be a synchronous session in which all students will join together online at the same time to talk. These sessions will use *Blackboard Collaborate* to join all participants together in a session where you can text chat, voice chat, and see the computer desktop of the instructor. While these are optional, most students find them a very valuable part of the week.

## Disease of the Week (DotW) Presentations

During the semester, you will have one opportunity to report briefly on a current emerging disease to your classmates during the weekly synchronous sessions.

## **Discussion Facilitation and Participation**

Each week, you will answer given discussion questions and reply to the answers of two other classmates.

## **Weekly Self-Assessments**

At the end of each module, students will take a self-paced self-assessment to evaluate new knowledge obtained. This will be a mixture of multiple choice, true/false, matching, and short answer questions.

## **Wikis**

Twice during the semester, you will work on topics in extensive detail and share your findings with your classmates. The first wiki is an independent project about a historical disease and the second wiki is a group project on broader issues of emerging infectious diseases.

## **Accommodations**

To obtain disability-related academic adjustments and/or auxiliary aids, students should contact both the instructor and the Disability Resources and Educational Services (DRES) as soon as possible. You can contact DRES at 1207 S. Oak Street, Champaign, (217) 333-1970, or via email at [disability@illinois.edu](mailto:disability@illinois.edu).

## **Academic Integrity**

All students are assumed to have read and understood the “Code of Policies and Regulations Applying to All Students,” University of Illinois, and will be expected to act accordingly.

The Code is available online at <http://www.admin.uiuc.edu/policy/code/index.html>