

**Course Description:** In IB/ANTH 361, Ecology and Human Health, we explore the emergence of infectious diseases and other human health issues from an ecological perspective, including vector-borne diseases, diseases spread from wildlife in terrestrial and aquatic ecosystems, and the role of pathogens and parasites in community and population ecology, food webs, and ecosystem functioning. Attention will be placed on how current and future global change and biodiversity loss will contribute to the increasing prevalence of emerging human diseases.

### **General Course Information**

#### **Instructional team:**

##### **Instructor:**

Dr. Nick Anderson ([nlndrsn2@illinois.edu](mailto:nlndrsn2@illinois.edu))  
2002D Natural History Building  
Office hours: Tuesdays and Thursdays 2 - 3 PM and by appointment

##### **Teaching Assistant (TA):**

Derek McFarland ([derekbm2@illinois.edu](mailto:derekbm2@illinois.edu))  
2092 Natural History Building (IB Learning Center)  
Office hours: Wednesdays 2 - 4 PM

##### **Classroom Assistant (CA):**

Susan Lim  
2092 Natural History Building (IB Learning Center)  
Office hours: Monday and Wednesday 11 AM - 12:30 PM and Friday 12 - 2 PM

**Course meetings:** Tuesdays and Thursdays, 12:30 - 1:50 PM in 213 Gregory Hall

**Website:** The course Moodle page is at: <https://learn.illinois.edu/>

**Credit:** 3 undergraduate hours

**Prerequisites:** None (Previous course work in Ecology (e.g., IB 203) may be helpful)

**Required textbook:** There is no required textbook for this course. Required readings will be provided in PDF format on the course website.

### **Course Goals and Objectives**

This course aims to provide you with the tools to evaluate the ecological underpinnings of past, present, and future challenges to human health and prepare you for future courses and careers related to epidemiology, public health, practicing medicine, science communication, and public policy.

By the end of this course, you will be able to:

- View past, present, and future challenges to human health through an ecological lens
- Describe factors that contribute to the emergence of infectious diseases in humans
- Demonstrate cultural competency when discussing human actions and customs that contribute to the emergence and spread of infectious diseases
- Use critical thinking skills and quantitative reasoning to solve ecological human health problems
- Comprehend primary scientific literature
- Critically evaluate science-related news and information

Lesson-specific objectives are listed at the start of each lesson on the course website and lecture slides.

## Course Structure

IB/ANTH 361 is an in-person, undergraduate-level, 3-credit course. Students should expect to devote 3 hours per week to attending class and 6-8 hours per week to homework assignments, class projects, and reviewing lecture materials.

While many college-level courses in the sciences focus on rote memorization and multiple choice-style exams, educational studies show this results in a low level of comprehension and retention of the material. In this class, we will utilize various techniques to encourage the development of higher-order cognitive skills and understanding (e.g., the ability to look at a graph and understand the scientific hypothesis being tested). As such, exams will be designed to evaluate both comprehension of the material and higher-level reasoning skills. Assigned readings, online quizzes, and in-class exercises and discussions will help students develop these skills and prepare for this examination style.

### Topic Outline

1. Epidemiology of Infectious Diseases
2. Population Ecology and Human Health
3. Community Ecology and Human Health
4. Biodiversity, Predators, & the Dilution Effect
5. Aquatic Ecosystems and Human Health
6. Global Change and Disease
7. Conservation Medicine
8. Ecological-Epidemiology
9. Climate Change and Human Health
10. Microbial Ecology and the Human Microbiome
11. Pandemics

## Course Components

**Pre-lecture activities:** There is no textbook for this course. Instead, I will assign readings from science news or primary scientific literature. Assigned readings should be read in their entirety, including the more challenging research articles. Each reading will have an associated pre-lecture activity (Moodle calls these “quizzes”) that will help you prepare for the discussion portion of each lecture. The quiz portion is due by the start of the associated class period. You will have one attempt for each activity. Each question has a “Check” button. When using the “Check” button, incorrect answers are penalized by 10%, and you are able to submit multiple answers until you have selected the correct answer.

**Lecture & Discussion:** This course's lecture and discussion portions will happen within the same 80-minute class period. Lectures will be the primary way in which we interact with the course material and will provide the necessary background and opportunities for students to interact with the material (see In-lecture activities). The “Discussion” time will be used to clarify and highlight the most important aspects of the assigned readings (i.e., what the major “take home” points of the pre-lecture activities are).

**In-lecture activities:** During lectures, students will be presented with a variety of “in-lecture activities,” the goal of which will be to augment student learning and participation, particularly at higher levels of cognitive reasoning (e.g., synthesizing ideas across scientific disciplines, critical evaluation of data, etc.). These exercises will be graded based on the completion of the activities and a qualitative evaluation of the effort.

**Exams:** There will be two non-cumulative exams (February 22 and April 11). They will consist of a mix of multiple-choice, matching, short-answer, multiple-part, and essay questions. These exams aim to evaluate your comprehension of the course materials and your high-level reasoning skills.

**Team Project:** The final two weeks of the course will be devoted to team projects. Teams will complete a series of assignments using the course website and prepare a final report. The results of the team projects will be discussed during the last class on April 30. The April 16, 18, 23, and 25 class times should be reserved for working on these team projects. Additional information will be provided prior to exam 2.

## Grading policies

**Academic Integrity:** This course will follow the University's Student Code (<http://studentcode.illinois.edu>). The code defines infractions of academic integrity, which include but are not limited to cheating, fabrication, and plagiarism. You are responsible for knowing what these infractions are and following these guidelines. If you do not feel you fully understand what constitutes plagiarism, please ask the instructor. Posting course content to online study help sites (e.g., CourseHero) and accessing content from previous semesters (e.g., past exams from friends) violate the Student Code and will be treated accordingly.

### Course grade breakdown:

Assessment type	Grade Weight
Exam 1	25%
Exam 2	25%
Team Project	25%
Pre-lecture activities	15%
In-lecture activities	10%

### Letter grades and cutoffs:

Letter	Plus (+)	Standard	Minus (-)
A	≥ 97.50%	92.50-97.49%	89.50-92.49%
B	87.50-89.49%	82.50-87.49%	79.50-82.49%
C	77.50-79.49%	72.50-77.49%	69.50-72.49%
D	67.50-69.49%	62.50-67.49%	59.50-62.49%
F	-	≤ 59.49%	-

**Dropped scores:** Your two lowest pre-lecture activity scores and two lowest in-lecture activity scores will be dropped from the final grade calculation. Your scores in the Moodle grade book reflect this policy.

## Course Policies

**Communication:** The Moodle Q&A Forum is the quickest and most convenient place to interact with your instructor about general course or content questions. You can also check if your question has already been asked and answered. I regularly check the Moodle Q&A Forum for new posts, while emails can sometimes become buried in my inbox. If your query is only relevant to you (e.g., military activation, DRES accommodations, extension on an assignment, etc.), please email me directly. Please send follow-up emails if I do not respond within 48-72 hours.

**Attendance:** Your regular attendance and engagement with course materials are vital to your success in IB/ANTH 361, and **non-attendance may affect financial aid**. Student attendance is defined as active participation in the course as described in the course syllabus. This course will have multiple mechanisms for student participation, which any of the following methods can document:

- Completion of exams
- Submission/completion of assignments
- Communication with the instructor
- Or other course participation

As a component of attendance, student email, course announcements, and discussion forums should be checked frequently (daily is recommended). The student is solely responsible for checking updates related to the course.

**Excused absences:** The university's absence policy can be viewed here:

<https://studentcode.illinois.edu/article1/part5/1-501/>. If your absence qualifies as excused, please follow the steps outlined below.

- **Missed Lectures:** Students can recover missed points from the in-class exercise by watching a recording of the lecture and completing the in-class exercise questions. Students should contact the instructor within 48 hours of the excused absence and submit the in-lecture activity within one week of the missed class.
- **Missed Exams:** Students with a documented excuse for missing an exam (see the link above for more information on obtaining the appropriate documentation) will be offered an opportunity to take a make-up exam at the discretion of the instructor.

**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). You can contact DRES at 1207 S. Oak Street, Champaign, (217) 333-1970, or via email at [disability@illinois.edu](mailto:disability@illinois.edu).

Accommodation letters should be emailed to the instructor as soon as possible to ensure accommodations are provided starting as early in the course as possible.

**Sexual Misconduct Policy and Reporting Statement:** The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are mandated reporters and must report any instances of sexual misconduct to the University's Title IX and Disability Office. An individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options. A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality can be found here: <https://wecare.illinois.edu/resources/students/#confidential>. Other information about resources and reporting is available here: <https://wecare.illinois.edu>.

**Inclusivity Statement:** This course's effectiveness depends upon creating an encouraging and safe classroom environment. Exclusionary, offensive, or harmful speech (such as racism, sexism, homophobia, transphobia, etc.) will not be tolerated and, in some cases, subject to University harassment procedures. We are all responsible for creating a positive and safe environment that allows all students equal respect and comfort. I expect you to help establish and maintain an environment where you and your peers can contribute without fear of ridicule, intolerance, or offensive language.

## Course Schedule

Week	Date	Unit	Topic
1	January 16	Epidemiology of Infectious Diseases	Introduction to ecology and human health
	January 18		The Past: Diseases that changed the world
2	January 23		The Present: Emerging and reemerging diseases
	January 25		The Future: Disease dynamics in an altered world
3	January 30	Population Ecology	Population ecology of infectious diseases
	February 01		Modeling infectious disease transmission
4	February 06	Community Ecology	Extending community ecology to pathogens
	February 08		Disease and keystone species
5	February 13	Biodiversity, Predators, & the Dilution Effect	Effects of biodiversity on disease dynamics
	February 15		Are predators good for your health?
6	February 20	Aquatic Ecosystems	Ecology of water-borne diseases
	February 22	EXAM 1	
7	February 27	Global Change & Diseases	Climate change and infectious diseases
	February 29		Landscape structure, disturbance, and disease dynamics
8	March 05	Conservation Medicine	Extending invasion biology to infectious diseases
	March 07		Infectious agents crossing the species barrier
9	March 12	NO CLASS - SPRING BREAK	
	March 14	NO CLASS - SPRING BREAK	
10	March 19	Ecological-Epidemiology	Food-borne illnesses: An emerging threat
	March 21		The economics of human health
11	March 26	Climate Change	Climate change impacts on water, fire, and drought
	March 28		Climate change and the world food supply
12	April 02	Microbial Ecology & the Human Microbiome	Microbiomes of the human body 1
	April 04		Microbiomes of the human body 2
13	April 09	Pandemics	How to prepare for the zombie apocalypse
	April 11	EXAM 2	
14	April 16	Team Project	Team Project Work Time
	April 18		Team Project Work Time
15	April 23		Team Project Work Time
	April 25		Team Project Work Time
16	April 30	Course Wrap Up	
	May 02	NO CLASS - READING DAY	