INFECTIOUS DISEASE BIOLOGY (MINOR)

College of Agriculture and Life Sciences

Program Website (https://cals.cornell.edu/microbiology/academics/undergraduate/minors/infectious-disease-minor)

Program Description

Infectious diseases represent an increasing threat to public health, agricultural productivity, and global biodiversity.

Recent years have seen an unprecedented rise in the incidence and severity of infectious diseases in human, plant, and animal populations across nearly all of the world's ecosystems. This intensification of diseases around the world is linked to human activity, which has brought about habitat transformation, climate change, biological invasions, environmental contamination, and ensuing losses of biodiversity.

Global disease dynamics have long-lasting economic, social, and global health impacts. It is more important than ever for students pursuing careers in biomedical, veterinary, medical, public health, natural resources and agricultural fields to appreciate the biology of the host-microbe and environmental interactions that give rise to infectious disease. Famous historical examples of significant impacts of infectious diseases include the "black death" (bubonic plague), the Spanish flu epidemic of 1918, and the Irish potato famine. More recently, infectious diseases have resulted in amphibian declines, decimation of bats from white nose disease of bats, and forest declines, plus the emergence of Ebola virus disease, SARS, MERS, and West Nile virus in birds and humans, and the chronic challenge of food-borne illnesses.

The Infectious Disease Biology Minor provides students with a broad perspective on health and disease, the dynamic nature of host-associated microbes, an in-depth understanding of the origins and dynamics of infectious diseases, and contemporary thought about the nature of health, disease, and disease management.

Academic Standards

Program Policies

To satisfy the requirements of the Infectious Disease Biology Minor, students must successfully complete one foundation course listed below (3 credits) plus a minimum of 12 additional credits at the 2000-level and higher, with at least one course selected from each of the lists (A, B, and C) below, for a minimum requirement of 15 credits. Credit for courses other than those listed below require the approval of the minor advisor. Special topic courses, independent study, seminar courses, and courses without regular instruction cannot be counted toward the credit requirement without prior written approval of the minor advisor.

All courses must be taken for a letter grade and students must receive a grade of "C" or better for the course to count toward the minor. Any undergraduate student at Cornell may enroll in the minor. However, this minor may especially complement academic programs of students majoring in Animal Sciences, Biological Sciences, Biology & Society, Environmental Science and Sustainability, Human Biology, Health and Society, Natural Resources, or Plant Sciences.

Program Information

- Minimum Credits for Minor: 15

Minor Requirements

Code	Title	Hours
Required Foundation Course (3 cr)		
BIOMI 2950	Biology of Infectious Disease: From Molecules to Ecosystems	3
Elective Courses (12 cr)		
In addition, students are required to take a minimum of 12 additional credits with at least one course selected from each of three groups below		
Group A: Infectious Agents		
BIOMI 2900	General Microbiology Lectures	3-4
BIOMS 4310	Medical Parasitology	2
BIOMS 3310	(No credit if previously enrolled in BIOMS 4310)	2
BIOMI 4040	Pathogenic Bacteriology	2-3
BIOMI 4090	Principles of Virology	3
PLSCI 4300	Mycology: The Interactive World of Fungi	4
PLSCI 6380	Fungal Genetics and Genomics	4
Group B: Host-Pathogen Interactions		
ANSC 3700	Immunology in Animal Health and Disease (No credit if previously enrolled in BIOMS 4150)	3
BIOMS 4340	Cellular and Molecular Microbial Pathogenesis: The Host Pathogen Interplay	3
ENTOM 3630	Bugs in Bugs– Insect Pathology and Immunity	3
BIOEE 4800	Ecological Genetics	4
BIOMI 2600	Microbiology of Human Contagious Diseases	3
BIOMI 3500	Marine Microbes and Disease in a Changing Ocean	3
BIOMS 4150	Essential Immunology (No credit if previously or concurrently enrolled in ANSC 3700)	3
BIOEE 4460	Plant Behavior and Biotic Interactions, Lecture	3
GROUP C: Disease and Health Management		
ANTHR 4041		
BIOMI 2500	Public Health Microbiology	3
BIOMI 3210	The Gut Microbiome	3
ENTOM 2100	Plagues and People	3
ENTOM 3520		
ENTOM 4000	Ecology and Evolution of Infectious Diseases	3
ENTOM 4520	Biology of Disease Vectors	3
ENTOM 6520		2
ENTOM 6530		2
NS 2600	Introduction to Global Health	3
NTRES 4150	Conservation with Communities for One Health	2
PLSCI 3010	Biology and Management of Plant Diseases	4

Learning Outcomes

- Describe and predict the impacts of infectious diseases on human, plant, animal, and global health.
- Describe the basic form, function, behavior, and diversity of infectious agents and their vectors.
- Assess the similarities and differences among human, animal, and plant diseases.
- Understand how hosts defend themselves against infectious agents.

- Apply the fundamental principles underlying disease dynamics at multiple spatial and temporal scales to predict how new diseases emerge.
- Critically evaluate surveillance and management strategies for the prevention of infectious diseases.
- Apply sound reasoning skills to identify the etiologies and regulators of disease processes.
- Speak the language of disease biology and communicate disease biology principles to others.