

Graduate School-Newark, Dept. of Biological Sciences  
offers a course on

# Biological Invasions



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This class will cover the biological background to one of the most severe environmental disasters to date: *the spread of non-native organisms worldwide*.

Topics will cover the ecology, evolutionary biology, biogeography, and eco-history of invasion.

**Spring 2006, Tuesdays 5:30-8:30 p.m - Boyden Hall – Room 421**

Prerequisite: Evolution, Plant Ecology or Animal Ecology (or equivalent)

More info from instructor: Claus Holzapfel (holzapfe@andromeda.rutgers.edu)

**26:120:534 Index #72021 - 21:120:422 Index #72573**

**Credits**

## Course overview

Humans have caused an unprecedented redistribution of earth's biota. Both incidentally and deliberately we continue to disperse an ever increasing array of species across previously insurmountable environmental barriers. Among the most far-reaching consequences of this reshuffling is a sharp increase in animal and plant invaders – non-native species that spread into new territories. The consequences are almost always detrimental to ecosystem function, biodiversity, and ecosystem service, and invasion is ranked as one of the major natural disasters today. The proposed course aims at reviewing the historical and biological background of biological invasion and at linking this background to topics of crucial societal concern (e.g. economics, emerging diseases). The format of the course combines lectures, student facilitated seminar and paper presentation, a lab compartment using a team-operated greenhouse experiment, computer-based experiments, and a field trip.

## Course objectives

The study of biological invasion fuses a wide range of scientific fields within organismic biology (in particular ecology and evolutionary biology) and more applied sciences including the social sciences. The proposed course has its focus on ecological and evolutionary aspects but will also address the multidisciplinary nature of the topic. Understanding the multifaceted problems of biological invasion processes aims at enabling students to review prior learned material in the biological curriculum and will allow them to apply them to a biological and environmental problem of great societal concern. It also should enable biology students to envision their professional role towards ecological problem solving.

## Pre- and co-requisites

Undergraduate background in either ecology or evolution

**Textbook:** currently no textbook is used, required study/reading material will be posted on the web.

## Syllabus

Week	Module	Topic
1	Introduction	What is Invasion? Why is significant? Not only “just so stories”!?
2	General Biology	Characteristics of invaders
3	History	Invasion trajectories: Volunteers and human companions
4	Biogeography	North America: regional perspectives
5	Biogeography	Europe and “Neo-Europe”: regional perspectives
6	Biogeography	Asia, Africa, Australia, the Tropics and Oceania: regional perspectives
7	Mid Exam	<b>Mid Exam</b>
8	Theory: Ecology	Landscape and ecosystem level effects of invasion
		<b>SPRING BREAK</b>
9	Theory: Ecology	Community level effects of invasion
10	Theory: Ecology	Populations: Models of invasive spread
11	Theory: Evolution	Invasives and evolution
12	Management	Invasive species control
13	Management	Economics, politics and legal issues, Career fair for biologist
14	Management	The scary stuff: humans as targets of invasion: emergent diseases – The Future
	Final Exam	<b>Final Exam</b>

## Evaluation criteria:

Mid Exam	30 or 40% (the exam with the highest percentage counts more)
Final Exam	30 or 40%
Paper	20%
Greenhouse protocol	10% (group effort)