RUTGERS
NEWARK
Federated Department
of Biological Sciences

NJIT
New Jersey's Science &
Technology University

Course Syllabus/Spring 2023

26: 120: 534 and 21:120:422
Biological Invasions

INSTRUCTORS:	**Claus Holzapfel**	**EMAIL:**	holzapfe@newark.rutgers.edu
OFFICE/OFFICE HOURS: TBA	**BOYDEN 408, OR ZOOM. IF THE DOOR IS OPEN, IT IS OPEN! I LIKE VISITORS**	**COURSE WEBSITE:**	Canvas
COURSE LOCATION(S):	Hill 106	**MEETING TIME(S):**	TU. 6:00-9:00PM

COURSE DESCRIPTION:

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 often detrimental to ecosystem function, biodiversity, and ecosystem service, and invasion is ranked as one of the major natural disasters today. The proposed course aims to review the historical and biological background of biological invasion and at linking this background to topics of crucial societal concern (e.g., biodiversity preservation, economics, emerging diseases). The format of the course combines lectures, student facilitated seminars and paper presentation and (potentially) a field trip.

PREREQUISITES:

Undergraduate background in either ecology or evolution
(21:120:222 Evolution or 21:120:280 Ecology or 21:120:370 Plant Ecology)

REQUIRED TEXT:

Currently no textbook is used, required study/reading material will be posted on Canvas.

LEARNING OBJECTIVES/GOALS:

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

List of learning outcomes

a. Students will be introduced to the full scope and significance of the global phenomenon of biological invasion.
b. Students will gain an understanding of the basic science behind the growing environmental problem of biological invasion
c. Students will be able to relate such aspects of basic science to problems of societal concern
d. Students will be able to review and connect aspects of their science curriculum to the environmental problem of invasion and will be led to understand how the professional skills and expertise of biologists can be the key to ecological problem solving.
e. Students will learn to appreciate current ecological problems and will develop citizen-based and professional stewardship skills. Thus, they will understand social and ethical implications of biological study and the responsibilities that arise from biological knowledge.

GRADING POLICY:

Your grade for this course will be determined based on the categories listed in the table below.

Midterm and Final exam (in person)	20 and 25
Attendance/reading questions (online)	15
Paper and presentations	40
TOTAL	**100**

REQUIRED CLASS WORK:

1. Weekly reading questions (online)

2. Paper summarizing the invasion status of an individual state of the US (excluding NJ!) or country outside the US. This will include the major problematic non-native species, their mode and history of invasion, their impact on biodiversity and economy, management policies, etc. A guideline for this paper (5-page text without references) will be provided. This monograph is also to be delivered in written form for **undergraduate students**, with 2 stages of review: 1st and 2nd draft and final paper. The paper will be presented (10 minutes) in oral form (with PowerPoint slides) to the class.

3**. Graduate students** will prepare a 20-25-minute lecture about a topic of their particular interest in relation to invasion biology, topics will be discussed on an individual basis). The lecture will be discussed with the instructor before delivery.

ATTENDANCE, MAKE-UP, AND LATENESS POLICY:

Attendance is required. If you must miss class for a valid reason, please discuss making up the missed material with your instructor as soon as possible.

Grading system

90-100 %	A
85-89	B+
77-84	B
75-76 %	C+
67-74	C
60-66	D

etc. (Fractions are rounded e.g., 89.5=90, 89.4=89)

Drop and withdrawal deadlines:
The last date for students to drop a course with no penalty: Thursday 1/26/23. The last date to withdraw from a course with a "W" grade: 1/26/23.

Course Policies:

Academic Dishonesty Policy*:* There is ZERO tolerance for academic dishonesty in this course which includes both cheating and any form of plagiarism. The punishment for dishonesty in this course will be a zero on the assignment and a consultation with the Dean's Office after which further action may be required. Please ask if you have any questions on this policy. You should also consult Rutgers University's Academic Integrity Policy: https://academicintegrity.rutgers.edu/academic-integrity-policy/ .

In addition to avoid potential plagiarism, papers need to be written by the students themselves. I realize that the use **of AI** (as for instance ChatGPT) is extremely tempting. I also realize that I cannot control the sue of them. We will discuss in class how to embrace this recent technology.

Lecture policy: All lectures will be given in-person (except one session and all the guest lectures which re by zoom) **and I will try to make recordings available afterwards on Canvas** for student review. Note that students need to attend all sessions in person and only in justified cases absence will be allowed. Students should be aware of and follow the University guidance concerning web conferencing: https://it.rutgers.edu/knowledgebase/etiquette-and-best-practices-for-web-conferencing/.

*Prior to recording, students should notify anyone that may appear in the recording (including any residents where the recording is taking place) that the student is recording a video, in order to ensure that any recordings do not invade any third-party privacy rights.

Email policy: Other questions can be emailed – I will do my best to answer emails received on weekdays (those sent between 9am Monday and 5pm Friday) within 24 hours. Emails received on the weekend (after 5pm on Friday or before 8am on Monday) will be answered within 24 hours of the following Monday at 9am. General course communication from the instructor will be through Blackboard
Appointment policy: To schedule a meeting, please e-mail holzapfe@rutgers.edu with three proposed meeting times. We can meet in these ways, it up to you 1) Zoom Call (audio-only); 2) Zoom Call (audio + video); and 3) regular phone call to my office landlin973 353 5385, on request (4) in person in my office (with safe distancing (Boyden 408)
Course materials policy: All course materials (including recordings of lectures) are for students' own use only (no sharing or posting anywhere).
Religious Holiday Policy: Students are advised to provide timely (at least one class time prior) notification to instructor about necessary absences for religious observances and are responsible for making up the work or exams according to an agreed-upon schedule.

Disability Services: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, you complete and submit the Registration Form, schedule and complete an intake meeting, and submit appropriate documentation to the Office of Disability Services. If your request for reasonable accommodations is approved, you will receive a Letter of Accommodations (LOA), **which you should present privately to the instructor as early in the semester as possible**. *Accommodation is not retroactive and are effective only upon submission of the LOA to the instructor*. Please begin by submitting a completed Registration Form at the website below.
• **Applying for Services:** https://ods.rutgers.edu/students/applying-for-services
• **Documentation Guidelines:** https://ods.rutgers.edu/students/documentation-guidelines
• **Letter of Accommodations (LOA):** https://ods.rutgers.edu/my-accommodations/letter-of-accommodations
• **Office of Disability Services (ODS)**
Suite 219, Paul Robeson Campus Center
(973) 353-5375 odsnewark@rutgers.edu

Other concerns and problems. If you find yourself in distress for any reason, please reach out to the Rutgers CareTeam at https://myrun.newark.rutgers.edu/care-team. At Rutgers Newark you are never alone with your concerns!

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SCHEDULE AND COURSE OUTLINE: Dates listed by week (dates and exact itinerary might change); lectures will meet every week. By arrangement and if possible, there will be a half-day field trip towards the end of the semester (one class period will be canceled).

WEEK	MEETING TOPIC	NOTES/EXAMS
Week 1 Jan 17	Introduction: What is Invasion? Why is it important? Natural spread vs. man-made invasion	
Week 2 Jan 24	History: History of biological invasion Trajectories: Volunteers and human companions How do they come in?	Assignment of paper topic(s)
Week 3 Jan 31	General Biology & Biogeography: Characteristics of invaders & North America I: regional aspects	
Week 4 Feb 7	Biogeography: North America II: regional perspectives	
Week 5 Feb 14	Biogeography III: Europe, "Neo-Europe", and the rest of the world: regional perspectives	
Week 6 Feb 21	Theory: Ecology I - General hypothesis and Community level effects of invasion	**Undergraduate Paper draft due**
Week 7 Feb 28	Mid Term Exam	**Mid Exam**
Week 8 Mar 7	**PER ZOOM** Theory: Ecology II – Ecosystems Guest Lecture: TBA	Spring break March 13-21
No class	Mar 14 – Spring Break	
Week 9 Mar 21	Grad Student symposium (attended by all),	
Week 9 Mar 28	Theory: Evolution: Invasives and evolution Guest Lecture: TBA	**Full draft due**
Week 10 Apr 4	Management I: Invasive species control, economics, politics and legal issues, Public awareness and media: Are invasives always bad? Guest Lecture: TBA	
Week 11 Apr 11	Management II The scary stuff: humans as targets of invasion: emergent diseases – bioterrorism and invasives, biosecurity, The Future Guest Lecture: TBA	**Undergraduate Student presentations**
FIELD Trip on Sat or Sun	To be arranged	Field trip on Sat or Sun (TBA)
Week 12 Apr 18	Undergraduate Student Presentations	**Undergraduate Student presentations**
Week 13 Apr 25	**Asynchronous:** To live with a problem: The role of non-native species in our future	**Final paper Due**
DATE OF FINAL EXAM: May 9		