

Insects & The Environment
11:370:300

Number of credit hours: Three (3)

Semester: Spring 2022

Days and times of lectures: TBD

Days and times of lab: TBD

Location: Thompson Hall, Room TBD

Instructor: Dr. Chloe Hawkings

Office location: Thompson Hall, Room 132

Office hours: By appointment

Phone: (848) 932-0005 **Email:** c.hawkings@rutgers.edu

Course Overview: This course is an overview of insects and their role in our environment and how biodiversity and disease vectors are impacted due to pollution and global warming. The discovery of novel insect control mechanisms combined with advances in our understanding of insect biology and physiology can help us address sustainable pest control, food security, and insecticide resistance.

Prerequisites: General Biology I and II (01:119:115/116)

Course Description: This course will be an exploration of the diversity and roles of insects in natural and environments, impact of insects and pesticides on environmental quality, and discussion of environmental ethics in entomological science. The course introduces students to concepts of insect physiology and biology in understanding problems on non-target systems and how we can use insects to monitor the health of our environment. We also discuss the ethical nature of pest control and conservation. The course will focus on the advancements in pest management techniques and how novel methods can decrease the damage to our planet. The course will also introduce students to the fundamental concepts of insect biology, conservation and how it pertains to our environment.

Learning outcomes: This course is aimed at both students with an entomology background and those who are unfamiliar with the field. The overall objective of this course is to ensure that all students are

fully aware of the fundamental importance of insect conservation and the potential implications that their management has on our environment and apply this to address problems in insect populations and a changing climate.

Link to Entomology Undergraduate Program Goals: <https://entomology.rutgers.edu/undergraduate/>

1. Students should be able to define and properly use key terms used in environmental entomology presented in lecture material. (*addresses program goal 1*)
2. Students should be able to describe key processes associated with insect biology, physiology and how insecticides impact our environment. (*addresses program goals 1 and 3*)
4. Students should be able to examine literature pertaining to the environmental and understand the methodologies used to evaluate current control protocols, draw conclusions on the need for specific advancements in control strategies (*addresses program goals 3 and 4*)
5. Students should be able to produce original work to investigate the environmental implications of an insect, either beneficial or as a pest that can be applied to their research interests. Emphasis is on the ability to draw conclusions on the significance of control and conservation and when to properly utilize them. (*addresses program goal 3*)

Resources:

Text: No Text is required for this course

Resources: Relevant and current literature reviews that outline the evolving endangered species lists, conservation techniques and emerging control technologies will be used. Materials will be distributed weekly through Canvas.

Course Calendar:

Lecture 1: Course outline, Introduction to Environmental Impacts and their effect on Insects

Lecture 2: Insect Biology & Diversity

Lecture 3: Insect Pollinators *Quiz 1*

Lecture 4: Colony Collapse Disorder

Lecture 5: Insects as Decomposers & Nutrient Recyclers

Lecture 6: Insects as Bioindicators *Quiz 2*

Lecture 7: Entomophagy and Environmental Considerations

Lecture 8: Exam 1

Lecture 9: Insects in Decline

Lecture 10: Fundamentals of Insect Conservation & Endangered Insect Species

Lecture 11: Insect Migration and Conservation Strategies *Quiz 3*

Lecture 12: Conservation Priorities & the Burden of Choice

Lecture 13: Impact of Climate Change on Insects

Lecture 14: Habitat destruction *Quiz 4*

Lecture 15: Exam 2

Lecture 16: Insects as Pests; What is a Pest?

Lecture 17: Invasive Insects

Lecture 17: Environmental Impacts of Pests

Lecture 18: Insect Pest Management & Insecticide Use

Lecture 19: Effects of Insecticides on Birds and Mammals

Lecture 20: Effects of Insecticides on Plants & Aquatic Systems

Lecture 21: Exam 3

Lecture 22: Insecticide Resistance

Lecture 23: Secondary Pest Outbreaks

Lecture 24: Ethics and Concerns with Insect Control *Quiz 5*

Lecture 25: Case Study Presentations

Lecture 26: Case Study Presentations & Final Review

Lecture 27: Class End

Lecture 28: Final Exam

Grading and assignment:

Exams: This course will have three midterm exams consisting of both multiple choice and essay style questions which cover material from lectures prior to the exam. One final exam is cumulative and covers all lecture material. The exams will assess the ability of the student to define key processes and terms associated with the lecture material

Quizzes: Five quizzes will be assigned at the beginning of class to be completed before the lecture begins. Students will be quizzed on their ability to understand and memorize lecture material

Case Study Project: Students will propose and write a one-page, environment-based exploration of an insect in regard to its conservation or control and its environmental implications to reflect the student's area of interest. Students are expected to apply the knowledge from this course to a real-world application of their choosing, correctly identifying the potential significance. Students will present their work to the class using a 5 min powerpoint. Case studies will be peer reviewed during class sessions to aid in the understanding and articulation of the environmental concerns of an insect.

Total % contributed (course):

Exams (15% each)	60%
Case Study Presentation	20%
Quizzes (2% each)	10%
Participation/Peer reviews	10%

Attendance Policy

Attendance is expected and if you expect to miss classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

Course Etiquette

Participation is required for participation points, failure to participate in discussion will result in a zero. This course requires participation in class activities, discussions, and through questions. A strict late policy is followed in this class, lateness is regarded as absence. If you miss a class you are responsible for catching up in time for assignments. classes can only be excused through university approved absences. The instructor should be provided proof of university approval no more than one week after the exam date. All assignments are expected to be submitted before the due date. Failure to submit an assignment before the deadline without a university approved absence will result in a zero on the assignment. No

disturbances will be tolerated in class, this includes engaging in disruptive behavior and inappropriate cell phone or laptop use that is not related to the course. We strive to create a positive classroom climate to facilitate all students to be able to learn. Negotiations of grades will not be considered and there is no rounding up of overall grades for the course.

Americans with Disabilities Act (1990)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an

accommodation, please visit the Office of Disability Services or contact their office for further information. Please follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full policies and procedures are at <https://ods.rutgers.edu/>

Academic Integrity

The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu/academicintegrity-policy>. The principles of academic integrity require that a student: properly acknowledge and cite all use of the ideas, results, or words of others. You must acknowledge **all** contributors to a given piece of work. All work submitted for a course or other academic activity must be produced by the student turning in the assignment or task and is produced without the aid of impermissible materials or impermissible collaboration. All data or results must be obtained by ethical means and reported accurately without suppressing any results inconsistent with his or her interpretation or conclusions. Treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress. You are expected to uphold the canons of the ethical or professional code of the profession for which he or she is preparing. Adherence to these principles is necessary in order to ensure that everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments. all student work is fairly evaluated, and no student has an inappropriate advantage over others. The reputation of the University for integrity in its teaching, research, and scholarship will be maintained and enhanced. Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its

students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

Student Wellness Services

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to

support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability



School of Environmental
and Biological Sciences

COURSE SYLLABUS

services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at:
<https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <https://rutgers.campuslabs.com/engage/organization/scarletlisteners>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.