

# **BIOLOGICAL CONTROL**

## **Biological Control (ENY 5241)**

### **Offered Spring Semester of Even Years**

**Instructor: Dr. Nicole F. Quinn**

**Teaching Assistant: Hyojin Jeong**

**Credits: 4**

**Indian River REC**

**772-577-7377**

**Office hours via Zoom (time TBD)**

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**THIS COURSE IS A 100% ASYNCHRONOUS EXPERIENCE FOR ALL STUDENTS**

### **DESCRIPTION AND OBJECTIVES**

This course examines the basic and applied concepts of biological control. This includes: overviews of the diversity and biology of biological control agents. current philosophies, strategies, and tactics of classical, augmentation, and conservation biological control. Specific cases of applied biological control are studied. Methods for monitoring and evaluating natural enemies are studied, and Federal laws, and public education are addressed. Narrated slide presentations and readings provide information for weekly discussions. An independent project on a topic directly related to biological control and a class project on biological control are key elements of the course.

In this course, students will learn:

1. Definitions of biological control.
2. History of biological control.
3. Diversity and biology of natural enemies
4. Applied biological control strategies: classical, augmentation, and conservation.
5. Natural enemy monitoring and evaluation.
6. Federal laws affecting biological control.
7. Current issues in biological control

### **NARRATED POWERPOINT LECTURES**

1-3 parts, present content on selected topics. The lectures are grouped into 7 modules. All lectures are available on the course's Canvas site.

### **READINGS AND OTHER SUPPORTING MATERIALS**

The textbook used in this course is listed below. It is free and available online through UF's library: <http://tinyurl.com/yp53pp2w>. This book and other readings provide additional, in-depth information and context. Either edition of the book is fine to use. Required reading will be indicated. Other material, such as supplemental readings and videos, will be provided.

Students are encouraged to seek out additional materials for discussion and self-enrichment throughout the course.

Hajek, Ann E., and Jørgen Eilenberg. *Natural Enemies: An Introduction to Biological Control*. Second edition. Cambridge: Cambridge University Press, 2018. Web.

## STUDENT ASSESSMENT:

### PACKBACK DISCUSSION

This assignment will provide students an opportunity to ask questions, discuss specific topics from the lectures and readings, and share experiences and opinions with peers and instructors. Each week, you must make one post and reply to two others. Posts are due on Wednesdays at 11:59pm EST and all replies are due on Fridays at 11:59pm EST. Details on Packback use will be provided in a separate document.

### WEEKLY QUIZZES

Short, weekly quizzes will cover the lectures and assigned reading for the week. They will be multiple choice and/or short answer questions.

### FINAL EXAM

Exam will be taken online. Students may use notes, books, and the Internet as resources during the exam. The Exam must be taken independently (with no help from other students, faculty, etc). The exam is time-limited, so students should prepare themselves for the exam beforehand rather than depend on finding information during the exam. **Once you start the exam, you will have four hours to complete it.**

The final exam is **cumulative** and will occur in **Week 15 of the course**.

### CLASS PROJECT

We will be conducting a long-term assessment of a classical biological control program. This will involve both field and laboratory work. Assignment details will be provided in a separate document. **THIS PROJECT CAN BE COMPLETED ASYNCHRONOUSLY.** Data collection is performed independently on agreed upon dates. If it is not possible for you to participate in data collection, your primary responsibility will be collating, summarizing, and analyzing the class data. Training can be completed in a virtual, asynchronous format as needed.

### INDIVIDUAL ASSIGNMENT

For this assignment, you will complete ONE of the following:

- I. **“Publishable” study of a biological control agent.** Must include: abstract, introduction, materials and methods, results with analysis and at least one figure or table, discussion, and references. The data must have been collected within six months of the course start date (data collected during the semester you are taking the course is allowed/encouraged). Data presented may be part of a larger dataset, as long as you are the one who has collected the data or is managing the project. Data that are being

prepared for use in your thesis or dissertation are encouraged. “Publishable” is in quotes, as I recognize that what you prepare is likely part of a bigger project and might only get through peer review once the entire project is complete. Prepare this assignment as though the data you present represent the entirety of the study.

## II. **Analysis of an emerging issue in biological control written for a scientific audience.**

This paper should be prepared as though it was going to be submitted to a peer-reviewed journal. Acceptable formats include but are not limited to:

- Forum papers in Annals of the Entomological Society of America:  
[https://academic.oup.com/aesa/pages/Manuscript\\_Preparation#Article%20Types](https://academic.oup.com/aesa/pages/Manuscript_Preparation#Article%20Types)
- Forum papers in Environmental Entomology:  
[https://academic.oup.com/ee/pages/Manuscript\\_Preparation#Article%20Types](https://academic.oup.com/ee/pages/Manuscript_Preparation#Article%20Types)
- Perspectives papers in Biological Control:  
<https://www.sciencedirect.com/journal/biological-control/publish/guide-for-authors>

Rubrics will be provided as a separate document.

Your assignment topic must be discussed with Dr. Quinn and finalized by **the second week of class**.

Your abstract is due **by the 4<sup>th</sup> week of class** and is worth **5% of your course grade**.

The completed assignment is due by **Week 14** and is worth **20% of your course grade**.

This assignment is intended to be flexible and useful. Please discuss any questions/concerns/ideas with Dr. Quinn.

This assignment should be prepared independently, without review or assistance from outside parties (ask if you are unsure).

### ASSESSMENT SCHEDULE:

Assignment	Weight (%)	Deadlines
Packback discussion	20%	Posts are due on Wednesdays 11:59pm EST and all replies are due on Fridays 11:59pm EST
Weekly quizzes	15%	Due Saturday 11:59pm EST each week
Final Exam	20%	Week 15
Class project	20%	Due Week 15 (Sampling dates and other deadlines TBA)
Abstract for individual assignment	5%	Abstract submitted by end of week 4
Individual assignment	20%	Project choice finalized by end of week 2 Assignment due by end of week 14
<b>TOTAL:</b>	<b>100%</b>	

### COURSE GRADING SCALE:

A = 100-93% B+ = 89.9-87% C+ = 79.9-77% D+ = 69.9-67%

A- = 92.9-90% B = 86.9-83% C = 76.9-73% D = 66.9-63% B- = 82.9-80% C- = 72.9-70% D- = 62.9-60%

E = 59.9-0%

Information on current UF grading policies for assigning grade points is at:  
[catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx](http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx).

### COURSE SCHEDULE\*:

Week	Start date	Topic	Textbook Readings	Deadlines
<b>Module 1: Introduction to Biological Control</b>				
1		Introduction to biological control (Part I)	Hajek Ch 1	
2		Introduction to biological control (Part II)	Hajek Ch 2	Individual project choice finalized by Friday
<b>Module 2: Biological Control Tactics</b>				
3		Classical biological control	Hajek Ch. 3	
4		Conservation and Augmentation Biological Control	Hajek Ch. 4-5	Abstract due
<b>Module 3: Herbivores</b>				
5		Herbivores I	Hajek Ch. 13	
6		Herbivores II	Hajek Ch. 14	
<b>Module 4: Predators</b>				
7		Predators I	Hajek Ch. 6	
8		Predators II	Hajek Ch. 7	
<b>Module 5: Parasitoids</b>				
9		Parasitoids I	Hajek Ch. 8	
10		Parasitoids II	Godfray Ch. 2,3,7	
<b>Module 6: Nematodes and pathogens</b>				
11		Microbes, fungi, and nematodes	Hajek Ch. 9-12	
<b>Module 7: Biological Control Today</b>				
12		Practical skills: sampling, evaluation, and other essential research skills	Hajek Ch. 2	
13		Biological Control Regulations and Ethics	Hajek Ch 18	
14		Challenges and opportunities: The future of biological control	Hajek Ch 19	Individual assignment due on Friday
<b>Last week of class</b>				
15				Final exam and class project due
<b>Last week of semester</b>				
16				

\*Please see the schedule uploaded to your canvas module, for dates relating to the semester you are taking this class in

### UNIVERSITY OF FLORIDA POLICIES AND ASSISTANCE:

#### Absences and Make-Up Work

Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at:

[catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx](http://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx).

#### Online Course Evaluation Process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at [evaluations.ufl.edu](http://evaluations.ufl.edu). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at:

[evaluations.ufl.edu/results/](https://evaluations.ufl.edu/results/).

### Academic Honesty

As a student at the University of Florida, you commit yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: [www.dso.ufl.edu/SCCR/honorcodes/honorcode.php](http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php).

### Software Use

All faculty, staff, and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

### Artificial Intelligence (AI) Use

Students are allowed to use advanced automated tools (artificial intelligence or machine learning tools such as ChatGPT or Dall-E 2) ***in moderation*** on assignments in this course if that use is properly documented and credited. For example, text generated using ChatGPT-3 should include a citation such as: "Chat-GPT-3. (YYYY, Month DD of query). "Text of your query." Generated using OpenAI. <https://chat.openai.com/>" Material generated using other tools should follow a similar citation convention. **Overuse or unattributed use of AI tools will result in a score of 0% for the assignment.**

### Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

University Counseling & Wellness Center, 352-392-1575, [www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)

Counseling Services Self-Help Library

Groups and Workshops Training Programs

## Outreach and Consultation Community Provider Database

### **Services for Students with Disabilities**

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faculty-student disability related issues. Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [disability.ufl.edu](http://disability.ufl.edu)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

### **Distance Courses**

Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See [www.distance.ufl.edu/student-complaint-process](http://www.distance.ufl.edu/student-complaint-process).