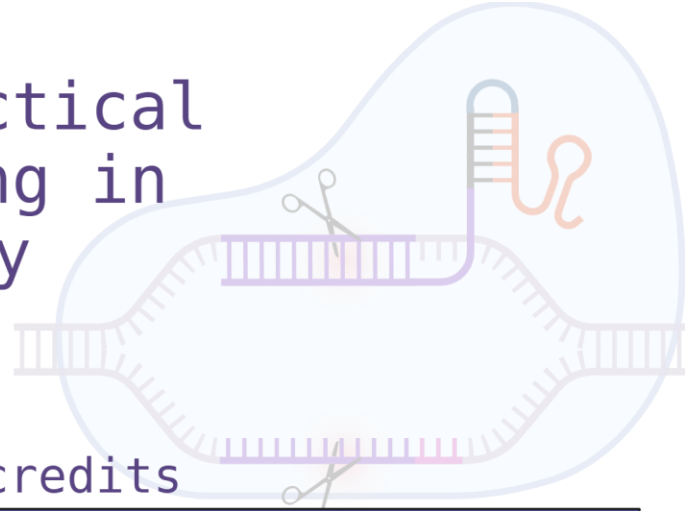




Exploring Practical Genome Editing in Entomology (ENY6934)

Spring 2025
Asynchronous - 3 credits



Instructor Information

Instructor

Dr. Bianca Burini
Email: bianca.kojin@ufl.edu
Phone: (772)226-6662
FMEL - Vero Beach

Hours

Zoom or in-person office hours:
Friday: 10:00 - 13:00
Zoom link: <https://ufl.zoom.us/j/99456500926?pwd=8Abwcizol1hKiFkLo5FhPHbbvAFUOj.1>

Course description

This course explores the biology, genetics, and control of vector-borne diseases and agricultural pests. Students will study insect biology, vector-pathogen interactions, gene structure, and genome editing techniques, with a focus on genetic manipulation for both vector control and pest management strategies, including population suppression and replacement. Through engaging in group discussions, project development, and student presentations, participants will develop a comprehensive understanding of insect control methods, their real-world applications, and the ethical and social implications of using genetically modified organisms. Students will also design and critique control strategies, considering feasibility, safety, and environmental impacts.

Prerequisites

There are no prior coursework requirements, however, basic knowledge of molecular biology and genetics is recommended.

Evaluation

| Assignment Type | % of Final Grade |
|-----------------------|------------------|
| Assignments (3) | 15% |
| Lecture Videos | 10% |
| Readings | 10% |
| Final Project (1) | 35% |
| Journal (13) | 5% |
| Quizzes (14) | 20% |
| Discussion Boards (2) | 5% |
| Total | 100% |

Grades:

A=90-100%; B=80-89%; C=70-79%;
D=60-69%; F=<60%

See the current [UF grading policies](#) for more information.

Course Learning Objectives

Objective #1: Students will be able to list medically important vector-borne diseases and agricultural pests, indicate the vector and their respective pathogen when appropriate

Objective #2: Students will examine the vector and pathogen life cycles, and evaluate their life history traits that can be targeted in genetic control approaches.

Objective #3: Students will be able to indicate the building blocks of a gene and mechanisms of gene expression.

Objective #4: Students will indicate how to manipulate gene expression.

Objective #5: Students will be able to compare different methods of genome manipulation, highlighting their strengths and limitations.

Objective #6: Students will be able to apply genome manipulation to study entomology, understanding the concepts of reverse and forward genetics.

Objective #7: Students will be able to critique different methods for controlling vector populations by indicating the positive and negative sides of each one of them and offering suggestions for improvements.

Objective #8: Students will be able to evaluate different genetic methods for controlling vector populations by defining their objectives and assessing safety, environmental impacts, practicality, and feasibility.

Objective #9: Students will learn how to design a strategy to manipulate a vector genome to achieve a predetermined objective in the context of population control or understanding the organism's biology.

Objective #10: Students will be able to synthesize ethical and social perspectives on genetically modified organisms for human benefit.

Objective #11: Students will be able to create innovative community engagement strategies for public health initiatives.

Course Schedule

| | | |
|------------|---|--|
| Start here | Course Orientation | <ul style="list-style-type: none">• Syllabus• Instructor and classmate's Introduction video• What is acceptable and what is not? Academic Integrity on this course |
| Module 1 | Arthropods of medical, veterinary, and agricultural importance. | Week 1 - Introduction to Arthropods and Vector -borne diseases |
| | | Week 2 - Mosquitoes as Vectors of Disease |
| | | Week 3 - Ticks, Sandflies, and Flies as Disease Vectors |
| | | Week 4 - Agricultural Pests and Vector Control Strategies |
| Module 2 | Gene components and genome editing techniques | Week 1 - Components of a gene and mechanisms of gene expression |
| | | Week 2 - Manipulating gene expression |
| | | Week 3 - Genome editing Techniques |
| | | Week 4 - Genetics and genome editing in vector biology |
| Module 3 | Vector control strategies | Week 1 - Overview of vector control Methods |
| | | Week 2 -Evaluation and critique of vector control methods |
| | | Week 3 -Population suppression and replacement strategies |
| | | Week 4 -Designing genetic strategies for vector and pest control and research |

| | | |
|----------|---------------------------------------|--|
| Module 4 | Human values and community engagement | Week 1 -Ethical and social implications of genetic engineering in mosquito control |
| | | Week 2 - Human values, Policy, and Community Engagement |

Important dates

| Module | Week | Assessment | Due dates |
|----------|--------|---|----------------------|
| Module 1 | Week 1 | Quiz M1-W1/Journal/Introduce yourself video/Syllabus Quiz | Jan 17 th |
| | Week 2 | Quiz M1-W2/Journal | Jan 24 th |
| | Week 3 | Quiz M1-W3/Journal | Jan 31 st |
| | Week 4 | Quiz M1-W4/ 1 st part of Final Project/Journal | Feb 7 th |
| Module 2 | Week 1 | Quiz M2-W1/Journal | Feb 14 th |
| | Week 2 | Quiz M2-W2/Journal/Discussion Board | Feb 21 st |
| | Week 3 | Quiz M2-W3/Journal | Feb 28 th |
| | Week 4 | Quiz M2-W4/ 2 nd part of Final Project/Journal | Mar 7 th |
| Module 3 | Week 1 | Quiz M3-W1/Journal | Mar 14 th |
| | Week 2 | Quiz M3-W2/Journal/Discussion Board | Mar 28 th |
| | Week 3 | Quiz M3-W3/Journal | Apr 4 th |
| | Week 4 | Quiz M3-W4/ 3 rd part of Final Project/Journal | Apr 11 th |
| Module 4 | Week 1 | | |
| | Week 2 | Quiz M4-W2/Case study/Journal | Apr 23 rd |
| | Week 3 | Delivery of Final Project | May 2 nd |

Final Course Project

A final project will be conducted involving the design of a genetic control method for impacting disease transmission or management of crop pest. The project conceptualization will start in the beginning of the course with the choice of the arthropod in module 1, brainstorming of the genetic components of the strategy in module 2, the decision of the genetic control approach in module 3 and the creation of a community engagement strategy in module 4. The culmination of this project will occur in the last week of the course with a 7-10 minutes recording of a presentation of the approach. The recording will be shared with the classmates for a peer-review evaluation.

Learning Materials and Supplies

The course materials for this class were thoughtfully selected to ensure accessibility, affordability, and academic value. Instead of requiring a costly textbook, students will use a combination of open-access scientific papers, book chapters available through the University Library, and other resources freely accessible to enrolled students. These materials were chosen to reflect the latest research and concepts in the field while minimizing financial burdens.

The decision to rely on open-access and library-provided resources stems from my commitment to equitable learning opportunities and my participation in the University's textbook adoption process. This process not only helps reduce costs but also ensures that the materials align with the course objectives and provide a high return on investment (ROI) for students. By using these resources, students gain access to contemporary, high-quality information directly applicable to their academic and professional development.

The estimated material cost for this course is \$0. All materials will be distributed through the course website or the University Library portal, ensuring seamless and timely access.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. <https://helpdesk.ufl.edu/> | 352-392-4357

AI Usage

In this course, the use of Artificial Intelligence (AI) tools is not only allowed but actively encouraged. As the course focuses on the latest advancements in genetic engineering—a field intrinsically linked to cutting-edge technologies—it would be a disservice to your learning experience to prohibit AI use. Integrating AI into your workflow mirrors the professional environment where these tools are indispensable for research, problem-solving, and innovation.

Guidelines for AI Usage:

- Permitted Uses:** You may use AI tools for tasks such as generating ideas, analyzing data, drafting reports, and enhancing your understanding of course materials.
- Prohibited Uses:** AI should not be used to complete tasks where the instructor has explicitly prohibited its use (e.g., quizzes, specific assignments). Such directives will be clearly outlined in the instructions for each assignment.
- Transparency:** If you use AI tools for any assignment, please include a brief acknowledgment of the tool and its contribution to your work (e.g., "This summary was partially generated with [AI tool] and edited for clarity"). This promotes academic integrity and ensures proper evaluation of your understanding and skills.

Important Considerations:

- Compatibility with Demands:** Because AI is a powerful tool, assignments designed to permit its use will have appropriately challenging objectives. These tasks will require critical thinking, creativity, and the ability to effectively utilize AI outputs to meet the course's high standards.
- Learning Outcomes:** While AI can enhance your work, it is essential to approach it as a complement to your knowledge and skills, not a replacement. The goal is to develop your ability to harness AI in a meaningful and ethical way that advances your understanding of genetic engineering concepts.
- Support:** If you are unfamiliar with AI tools, guidance will be provided to ensure you can use them effectively and responsibly.

Incorporating AI into your learning process prepares you to meet the demands of a rapidly evolving field where technology and innovation are integral to success.

Instructor Interaction Plan

- Expect an instructor response to email and Canvas message within 48 hours, during weekdays
- Please do not wait until the weekend to complete assignments, as I may not be available to answer emails or messages as quickly.
- Expect instructor feedback for submitted assignments within one week past the assignment deadline
- Grades for assessments will be released within 48 hours of deadline
- If you ever have questions or need clarification on instructor feedback, please message or attend office hours.
- I will post an announcement at least once a week to give updates and class feedback.
- I will monitor and read the discussions. I may post to the entire class, within groups, or message you individually concerning the discussion to give you feedback. I invite your feedback in both midterm and end-of-term GatorEvals and plan to continuously improve student experience within the course. Your opinion is highly valued.

Required Technology & How to Obtain the Technology

- Required peripherals: camera, speakers, a microphone, or a headset.
- Links to all downloadable resources are provided. These resources include software and online tools, apps, plug-ins such as PDF Reader, media players, collaboration tools, social media, interactive multimedia apps, etc.
- Instructions are provided for how to access materials available through the institution's library or subscription services, including online journals or databases. When available, links are also provided.
- If publisher materials are required, clearly stated instructions for how to obtain and use any required access codes are provided.
- If proctoring or academic integrity services are utilized in the course, learners are provided with a description of their use, information about any device limitations, and instructions on how to obtain and use the services.
- Learners are informed of no-cost or low-cost technology options (e.g., hot spots, institutional hardware loans, computer labs, etc.).

Required Technology & Digital Information Literacy Skills

- Using the learning management system
- Using email with attachments
- Creating and submitting files in commonly used word processing program formats
- Downloading and installing software
- Using presentation and graphics programs
- Using web conferencing tools and software

- Using online libraries and databases to locate and gather appropriate information
- Using computer networks to locate and store files or data Using online search tools for specific academic purposes, including the ability to use search criteria, keywords, and filters
- Analyzing digital information for credibility, currency, and bias (e.g., disinformation, misinformation)
- Properly citing information sources
- Preparing a presentation for the final project

Communication Guidelines

- Use **Course Question Discussion Board**, for general course questions that others may have too.
- Use **Canvas Inbox (messaging tool)** for questions that are specific to your grades or submissions.
- **Email & phone correspondence** are for (1) setting a meeting time for office hours, (2) DRC accommodations; (3) emergency situations; or (4) highly sensitive situations.
- A respectful tone is used by all community members in all forms of communication.
- Written communication, both formal and informal, uses the official language of instruction rather than popular online abbreviations and graphic elements such as those sometimes used in social media.
- Video interactions reflect a respectful tone in verbal communications and body language.
- Spelling, punctuation, and grammar are correct.

Attendance

Since this course is asynchronous, there are no live sessions, and attendance is based on your engagement with course materials and completion of assignments by their due dates. Students are expected to participate actively by accessing weekly materials, completing discussions, assignments, quizzes, and other assessments on time. Regular participation is essential for keeping up with the course and meeting learning outcomes. Missed assignments and late engagement will impact your overall grade, so please stay on schedule and reach out if you encounter any challenges. For more information: [UF Attendance Policies](#)

Academic Honesty

University of Florida students are bound by the Honor Pledge. As a student at the University of Florida, you have committed 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 by abiding by the Student Honor Code." 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 Student Conduct Code Process.

Student Privacy Disclaimer

This course is fully asynchronous, with pre-recorded lectures that do not involve student participation, with the exception of the introductory video, for the purpose of building community and the final project, which requires students to record a video presentation. The recorded videos are intended to be shared with other students in the class as a means of peer learning and engagement.

If you do not consent to have your video shared with the class, please inform me in advance so we can discuss alternative options for completing the final project. Your privacy and comfort are important, and your choice will be respected without penalty.

In-Class Recording

The pre-recorded lectures are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.a.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via the GatorEvals site. Summaries of course evaluation results are available to students at GatorEvals Public Data.

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.

Services for Students with Disabilities

A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Campus 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 for currently enrolled students at no cost. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

Health and Wellness

- **U Matter, We Care:** If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or <https://umatter.ufl.edu/> to refer or report a concern and a team member will reach out to the student in distress.
- **Counseling and Wellness Center:** Visit <https://counseling.ufl.edu/> or call 352-392-1575 for information on crisis services as well as non-crisis services.
- **Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <https://shcc.ufl.edu/>
- **University Police Department:** Visit <https://police.ufl.edu/> or call 352-392-1111 (or 9-1-1 for emergencies).
- **UF Health Shands Emergency Room / Trauma Center:** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; visit <https://ufhealth.org/locations/uf-health-shands-emergency-room-trauma-center>
- **GatorWell Health Promotion Services:** For prevention services focused on optimal well-being, including Wellness Coaching for Academic Success, visit <https://gatorwell.ufsa.ufl.edu/>.

Academic Resources

- *E-learning technical support*: Contact the UF Computing Help Desk at 352-392-4357 <https://it.ufl.edu/helpdesk/> or via e-mail at helpdesk@ufl.edu.
- *Career Connections Center*: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support*: Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center*: 1317 Turlington Hall, 352-392-2010. General study skills and tutoring.
- *Writing Studio*: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Concern*: [Report Student Concerns or Conduct](#)

Student Complaints

- Residential Course: <https://www.sfa.ufl.edu/written-student-complaints/>
- Online Course: <https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint>

Privacy and Accessibility Policies

Information about the privacy policies of the tools used in this course:

- Microsoft
 - [Microsoft Privacy Policy](#)
 - [Microsoft Accessibility](#)
- Perusall
 - [Perusal Accessibility](#)
 - [Perusal Privacy](#)
- PlayPosit
 - [PlayPosit Privacy Policy](#)
 - [PlayPosit Accessibility](#)
- YouTube (Google)
 - [YouTube \(Google\) Privacy Policy](#)
 - [YouTube \(Google\) Accessibility](#)
- Zoom
 - [Zoom Privacy Policy](#)
 - [Zoom Accessibility](#)
- Adobe
 - [Adobe Privacy Policy](#)
 - [Adobe Accessibility](#)
- Instructure (Canvas)
 - [Instructure Privacy Policy](#)
 - [Instructure Accessibility](#)