Honey Bee Biology and Beekeeping: ENY 3571 Spring 2024

Instructor Contact Information **Teaching Assistants**	Dr. Patrick Bohlen Patrick.Bohlen@ucf.edu (contact via Webcourses only) Office phone: 407-823-1940 (office) Stephanie Morris, Nicole Boisson
Office Hours:	By appointment only; through Zoom or in person.

Syllabus subject to change: modifications will be shared via Webcourses

COURSE INFORMATION

Course Description:

This course will examine the biology of honey bees and the science and art of apiculture by exploring the life history, ecology and management of honey bees. Course topics will include: honey bee anatomy, physiology, social structure, pests/diseases, pollination ecology, management, breeding, and current topics in beekeeping. The lab portion of the class will involve field exercises and hands-on experience in the UCF Apiary, campus landscapes and natural lands. This course is designated as a Research-Intensive (RI) course. This designation will be noted on your transcripts. Your active engagement in the research and/or creative scholarship process will be the core of your learning experience in this course. A significant portion of your grade (40%) will be derived from both your active participation in the research process and the final products of your research project.

Course Requirements:

This course will require activities both in and outside of class. The main elements of the course are lectures, chapter review quizzes, field and exercises and a final research project. Students are expected to be respectful to instructors and their fellow students and behave in an adult and professional manner.

Course Learning Objectives:

After completing this course students will be able to:

1. Explain the similarities and differences between honey bees and other bee species.
2. Describe the different types of sociality in insects and the importance of eusociality to the success of honey bees.
3. Identify the different types of honey bee races, where they come from and what are their key characteristics.
4. Describe the basic biology, anatomy and physiology of honey bees, including the importance of chemical communication via pheromones in contributing to social cohesion.

5. Give a basic overview of the history of beekeeping and development of modern beekeeping practices, including the components that make up modern hives.
6. Perform a basic hive inspection and identify the key features that one typically looks for during an inspection.
7. Understand the threats to honey bee health, including pathogens and parasites, methods for identifying these threats and possible action to prevent or treat them.
8. Explain how apiculture can be used as a window into broader topics, such as: disease ecology, invasive species, ecotoxicology, evolution, pollinator ecology, conservation, global change, and agriculture.

Course Research Objectives:

Students will work together in groups on a semester-long research project. The main objectives of the research experience are to:

1. Learn how knowledge is created in honey bee biology and related fields through engagement in the creative research process.
2. Evaluate and synthesize scholarly literature and relevant data in the field.
3. Learn how to formulate an original research question.
4. Develop an appropriate study design and methodology to address the research question.
5. Review and interpret findings with faculty feedback, and present the findings to the rest of the class.

Required Reading Materials:

Caron, Dewey M and Lawrence J. Conner. 2022. *Honey Bee Biology and Beekeeping, Third Edition*. The text can be purchased online for $90 from Wicwas Press https://wicwas.com/project/1704/, and from other vendors online.

Informative websites:

There are many excellent internet resources related to bees and beekeeping. I have found the following site to be useful for beginning and experienced beekeepers: http://scientificbeekeeping.com/; http://entnemdept.ufl.edu/honey-bee/; https://www.honeybeesuite.com/; http://beekeepinglikeagirl.com/; http://bushfarms.com/bees.htm; https://www.perfectbee.com/

Semester Working Groups:

The class will be divided into four groups of four students each at the beginning of the semester. Students will work with the other students in their group on lab and field exercises throughout the semester, and will work together with their group on the class research project and final presentation and paper as described below.

Evaluation Procedures

Grade Category: Chapter Quizzes
Description of Requirements: Students will complete quizzes in Webcourses throughout the semester to demonstrate comprehension of material covered in the book chapters. Quizzes will be assigned at the end of each chapter and completed outside of class.
Grade Contribution: 30% (30/100 points)

Grade Category: Field and Lab Exercise Discussion Posts
Description of Requirements: Students will submit reflective discussion posts on Webcourses for all field and lab exercises throughout the semester. The discussion posts will be graded with a rubric that includes an accurate description of class activities, use of correct terminology, activity relevance, proper grammar, and responses to at least two other student's posts.
Grade Contribution: 30% (30/100 points)

Grade Category: Research Project Data Sheets
Description of Requirements: Students will engage in a class research project and each semester working group will submit their data sheets to the instructors. The data from all groups will be combined into a single data set that each group will use to prepare their final project abstract and presentation. Details on the project and a grading rubric for the presentation will be provided through Webcourses.
Grade Contribution: 10% (10/100 points)

Grade Category: Research Project Abstract
Description of Requirements: Students will engage in a group research project and each group will submit an abstract for a final presentation scheduled during the final exam time slot for the class. Details on the project and a grading rubric for the presentation will be provided through Webcourses.
Grade Contribution: 10% (10/100 points)

Grade Category: Final Project Presentation
Description of Requirements: Students will present a final 12-15-minute PowerPoint presentation on the topic covered in their research project. A grading rubric will be provided through Webcourses to guide students in preparing and delivering the presentation.
Grade Contribution: 20% (20/100 points)

Grading Scale: A (100-95), A- (94-90), B+ (89-85), B (84-80), C+ (79-75), C (74-70), D (69-60), F (59-0)

Technology Requirements:

Technology	Expectations for Use
E-mail:	***ALL email communications with the instructors must be made through Webcourses.*** Grades will not be provided over email. Communication with classmates via email will be done at the student's discretion.
Webcourses:	Webcourses will be used for this class. Please check Webcourses regularly (every 2-3 days) for updates, assignments, quizzes and other class information.
Computer Software	Students are expected to be able to use Microsoft Word, Excel, and Power Point.

Additional Policies

Grading and evaluation	Grades will be calculated according to the above evaluation procedures. Grades will not be distributed in class; an appointment must be made with an instructor to discuss grades. Grades will not be given over the phone, or via email.
Attendance and participation	Class attendance and participation is expected for all class session and activities. **Valid excuses for missing class are: illness (medical note required); participation in university-sponsored events that specifically grant class waivers (a "Program Verification" form is required); religious observances (these must be requested by the 10th business day of the term); military duty; attending a funeral of an immediate family member; and court-imposed legal obligations.** If students cannot attend class, it is their responsibility to get notes or resources about for the missed lecture. Coming to class unprepared, arriving late and leaving early are strongly discouraged. If students cannot attend class, it is their responsibility to get the notes/resources to understand what was covered in class lecture. Coming to class unprepared, arriving late and leaving early will not be tolerated.
Field work	This course includes visiting active bee hives in the UCF apiary (bee yard) and other field exercises that may include visiting remote wild locations on campus. Students are expected to wear protective gear at all times in the apiary, and appropriate clothing and footwear in the field as directed buy the instructor. Protective gear, including jacket, veil and gloves will be distributed to each student during the first lab class. Students will be expected to take proper care of the gear, and return it at the end of the semester. Students can expect that they may be stung by bees during hive inspections and they should inform the instructor if they have any known allergies that may compromise their participation in class activities.
Religious Observances	Students must notify the instructor no later than the 10th business day of the term if they intend to miss class for a religious observance. For more information, see the UCF policy at https://regulations.ucf.edu/chapter5/documents/5.020ReligiousObservancesFINALJan19.pdf
Academic integrity	As stated in the UCF creed, integrity, scholarship, community, creativity, and excellence are the core values that guide our conduct, performance, and decisions as members of the UCF community. Plagiarism and cheating contradict these values, and are very serious academic offenses. Penalties can include a failing grade in an assignment or in the course, suspension, or expulsion from the university. Students should familiarize themselves with UCF's Rules of Conduct at <https://scai.sdes.ucf.edu/student-rules-of-conduct/>
Course Accessibility Statement	The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who

	need access to course content due to course design limitations should contact the professor as soon as possible. Students should also connect with Student Accessibility Services (SAS) http://sas.sdes.ucf.edu/ (Ferrell Commons 185, sas@ucf.edu, phone 407-823-2371). For students connected with SAS, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential course access and accommodations that might be necessary and reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student. Further conversation with SAS, faculty and the student may be warranted to ensure an accessible course experience.
First week academic assignment requirement	As of Fall 2014, all faculty members are required to document students' academic activity at the beginning of each course. In order to document that you began this course, please complete the Academic Assignment in Webcourses by the end of the first week of class. Failure to do so may result in a delay in the disbursement of, or decline of your financial aid.
Campus Safety Statement	Every UCF classroom contains an emergency procedure guide posted on a wall near the door. If there is a medical emergency during class, students may need to access a first-aid kit or AED (Automated External Defibrillator). To learn where those are located, see http://www.ehs.ucf.edu/AEDlocations-UCF. Students should know the evacuation routes from each of their classrooms and have a plan for finding safety in case of an emergency. To learn about how to manage an active-shooter situation on campus or elsewhere, consider viewing this video https://youtu.be/NIKYajEx4pk
Deployed active duty military students	Students who are deployed active duty military and/or National Guard personnel and require accommodation should contact the instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.
Make-up assignments for authorized University events or co-curricular activities	Students who represent the university in an authorized event or activity (for example, student-athletes) and who are unable to meet a course deadline due to a conflict with that event must provide the instructor with documentation in advance to arrange a make-up. No penalty will be applied. For more information, see the UCF policy at http://policies.ucf.edu/documents/4-401.1MakeupAssignmentsForAuthorizedUniversityEventsOrCocurricularActivities.pdf
UCF Cares	During your UCF career, you may experience challenges including struggles with academics, finances, or your personal well-being. UCF has a multitude of resources and free services available to all students. Please visit UCFCares.com if you are seeking resources and support, or if you are worried about a friend or classmate.
Title IX policy	Title IX prohibits sex discrimination, including sexual misconduct, sexual violence, sexual harassment, and retaliation. If you or someone you know

	has been harassed or assaulted, you can find resources available to support the victim, including confidential resources and information concerning reporting options at https://letsbeclear.ucf.edu and http://cares.sdes.ucf.edu/.

Course Schedule, Critical Themes & Goals (several of the lab activities may be affected by weather or seasonal variation, and the class schedule is subject to change)**:**

Class Schedule	
Week of January 8	• Introductions; Review Syllabus; Course Orientation; Textbooks • Lab exercise: Equipment and protective gear; winter equipment preparation
Friday, January 12, Drop/Swap and Add Deadline	
Week of January 15	• Chapters 1-2: Introduction; honey bee classification • Lab exercise: Winter equipment preparation cont'd if needed; overview of semester research project
Week of January 22	• Chapters 3-4: Insect sociality; honey bee castes • Lab exercise: Visit feral hives; deploy swarm traps
Week of January 29	• Chapters 5-6: Honey bee anatomy; bee's nests and hives • Lab exercise: Hive inspection, check strength
Week of February 5	• Chapters 7-8: Dance language; pheromone communication • Lab exercise: Pollinator observation training
Week of February 12	• Chapter 9-10: Queens and swarming; foraging • Lab exercise: Hive inspection
Week of February 19	• Chapters 11-12: Getting started; basic management. • Lab exercise: Class time to work on research project
Week of February 26	• Chapter 14: Spring management • Lab exercise: Hive inspection
Week of March 4	• Chapter 18: Pollination and managing for pollination. • Lab exercise: Class time to work on research project.
Week of March 11	• Chapter 17 Queen mating and rearing • Lab exercise: Hive inspection
Week of March 18, Spring Break, No Classes	
Week of March 25	• Chapter 19: Bee mites and IPM • Lab exercise: Hive inspection: varroa mite monitoring.
Monday, March 25, Withdrawal Deadline	
Week of April 1	• Chapter 20: Diseases and pests • Lab exercise: Bee/brood dissections
Week of April 8	• Chapter 15: Honey harvest

	• Lab exercise Semester research project data review
Week of April 15	• No lecture: Free to work on semester research project • Lab exercise: Free to work on semester research project
Monday, April 22	• **Draft of Abstract Due**
Date TBD	• **Final Presentation and Final Abstract Due**