



Honey Bee Biology and Beekeeping: ENY 3571 Spring 2022

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| Instructor Contact Information | Dr. Patrick Bohlen Patrick.Bohlen@ucf.edu (contact through Canvas only) Office phone: 407-823-1940 (office) |
| Teaching Assistants | Johanna Packer, Sophia Stahl |
| Websites | www.green.ucf.edu , www.arboretum.ucf.edu |
| Office Hours: | By appointment only; through Zoom or in person. |

Syllabus subject to change: modifications will be shared via Webcourses

COVID-19 POLICIES AND NOTIFICATIONS

The COVID-19 pandemic impacts us all in many ways, including physically, mentally, emotionally, financially, academically, and professionally. I will work with you on challenges you may be encountering and to provide support to help you succeed. However, please keep in mind that you are accountable for fulfilling all course requirements, especially in terms of class attendance, participation, and contributions.

UCF expects that all members of our campus community who are able to do so get vaccinated, and we expect all members of our campus community to wear masks indoors, [in line with the latest CDC guidelines](#). Masks are required in approved clinical or health care settings..

Notifications in Case of Changes to Course Modality

Depending on the course of the pandemic during the semester, the university may make changes to the way classes are offered. If that happens, please look for announcements or messages in Webcourses@UCF or Knights email about changes specific to this course.

COVID-19 and Illness Notification

Students who believe they may have been exposed to COVID-19 or who test positive must contact UCF Student Health Services (407-823-2509) so proper contact tracing procedures can take place. Students should not come to campus if they are ill, are experiencing any symptoms of COVID-19 or have tested positive for COVID-19.

Students should contact their instructor(s) as soon as possible if they miss class for any illness to discuss reasonable adjustments that might need to be made. When possible, please contact the instructor(s) before missing class.

In Case of Faculty Illness

If the instructor falls ill during the semester, there may be changes to this course, including having a backup instructor take over the course. Please look for announcements or mail in Webcourses@UCF or Knights email for any alterations to this course.

Course Accessibility and Disability COVID-19 Supplemental Statement

Accommodations may need to be added or adjusted should this course shift from an on-campus to a remote format. Students with disabilities should speak with their instructor and should contact sas@ucf.edu to discuss specific accommodations for this or other courses.

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. 2013 revision. *Honey Bee Biology and Beekeeping 2013 revised edition*. The text can be purchased online for \$65 or rented for \$41 from Amazon <https://www.amazon.com/Honey-Bee-Biology-Beekeeping-Revised/dp/1878075292>, or purchased directly from Wicwas Press for \$55 <https://wicwas.com/project/honey-bee-biology-and-beekeeping-revised-edition-55-00/>, although there could be shipping delays from that vendor. You might be able to find a used copy online but make sure it is the 2013 revision.

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 five groups of three 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 Reflections and Reports

Description of Requirements: Students will submit reflections in Webcourses for all field and lab exercises throughout the semester. Reflections may require attached reports as explained for individual assignments in Webcourses.

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 |
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| E-mail: | <i>ALL email communications with the instructors must be made through Webcourses.</i> 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

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| 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. |

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| 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 by 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 10 th 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. |
| Academic Activity Reporting | As of Fall 2014, all faculty 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. |

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| 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. |

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 | |
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| Week of January 10 | <ul style="list-style-type: none"> • Introductions; Review Syllabus; Course Orientation; Textbooks • Lab exercise: Equipment and protective gear; visit apiary |
| Friday, January 14, Drop/Swap and Add Deadline | |
| Week of January 17 | <ul style="list-style-type: none"> • Chapters 1-2: Introduction; honey bee classification • Lab exercise: Overview and demo of class research project |
| Week of January 24 | <ul style="list-style-type: none"> • Chapters 3-4: Insect sociality; honey bee castes • Lab exercise: Hive inspection; feed colonies if light |
| Week of January 31 | <ul style="list-style-type: none"> • Chapters 5-6: Honey bee anatomy; bee's nests and hives • Lab exercise: Visit feral colonies |
| Week of February 7 | <ul style="list-style-type: none"> • Chapters 7-8: Dance language; pheromone communication • Lab exercise: Deploy swarm traps; check hives for expansion |
| Week of February 14 | <ul style="list-style-type: none"> • Chapter 9-10: Queens and swarming; foraging • Lab exercise: Class time to work on research topic |
| Week of February 21 | <ul style="list-style-type: none"> • Chapters 11-12: Getting started; basic management • Lab exercise: Hive inspection; swarm prevention |
| Week of February 28 | <ul style="list-style-type: none"> • Chapter 14: Spring management • Lab exercise: Class time to work on research project |
| Week of March 6, Spring Break, No Classes | |
| Week of March 14 | <ul style="list-style-type: none"> • Chapter 18: Pollination and managing for pollination • Lab exercise: Hive inspection |
| Week of March 21 | <ul style="list-style-type: none"> • Chapter 17 Queen mating and rearing • Lab exercise: Class time to work on research project |
| Friday, March 25, Withdrawal Deadline | |
| Week of March 21 | <ul style="list-style-type: none"> • Chapter 19: Bee mites and IPM • Lab exercise: Hive inspection: varroa mite monitoring. |
| Week of March 28 | <ul style="list-style-type: none"> • Chapter 20: Diseases and pests • Lab exercise: Bee/brood dissections |
| Week of April 4 | <ul style="list-style-type: none"> • Chapter 15: Honey harvest |

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| | <ul style="list-style-type: none">• Hive inspection: Spring build up |
| Week of April 11 | <ul style="list-style-type: none">• Honey tasting• Lab exercise: Semester research project data review. |
| Week of April 18 | <ul style="list-style-type: none">• No lecture: Free to work on final project• Lab exercise: Free to work on semester research project |
| Monday, April 25 | <ul style="list-style-type: none">• Draft of Abstract and Final Presentation Due |
| Friday, April 29 | <ul style="list-style-type: none">• Final Presentation and Final Abstract Due |