

ENY 4573
Beekeeping
Spring 2016
3 credits

Co-Instructor: Dr. Joshua Campbell

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Office Hours: Due to Dr. Campbell's and Ms. Mortensen's travel schedules, office hours and phone meetings are available only by email appointment. The Entomology and Nematology building is named Charles Steinmetz Hall or Building 970 on the campus map (<http://campusmap.ufl.edu/>).

Course Description: The biology of honey bees and the craft of apiculture will be examined by exploring the natural history, biogeography and ecology of honey bees. Honey bee anatomy, physiology, colony social structure, pests/diseases, pollination ecology, management and current topics in beekeeping will be discussed.

Additional Information Regarding the Course: This course contains significant scientific content. If you are unsure of any vocabulary terms or scientific practices, please take the time to research them. It will be easy to fall behind if you do not understand the content. A basic biology prerequisite is recommended, though not required.

Course Learning Objectives:

1. Compare the natural histories of honey bees with those of other bees, emphasizing the development of sociality in bee hymenoptera.
2. Examine the diversity and biogeography of honey bees.
3. Discover the intricacies of honey bee biology, anatomy, physiology.
4. Determine the contributions of nest structure, eusocial behavior, and colony superorganismic traits to the success of honey bees globally.
5. Appraise the history, development, and practice of apiculture.
6. Associate apiculture with production agriculture, ecosystem health, and human success.
7. Synthesize transcending topics (such as parasitology, invasive species biology, IPM, etc.) using apiculture as a model.

**This course is co-taught with EYN 5572: Apiculture.

Recommended Texts (not required):

1. Caron, D.W. 2013 (revised from 1999). Honey Bee Biology and Beekeeping. Wicwas Press. Cheshire, CT, 368 pp.
2. Delaplane, K.S. 2006. Honey Bees and Beekeeping: A Year in the Life of an Apiary, 3rd Edition. The Georgia Center for Continuing Education, Athens, GA, 108 pp.

Lectures: This is an online, Canvas-based course. The website for the SYLLABUS, ALL LECTURES, READING MATERIALS, ANNOUNCEMENTS, TESTS, ETC. will be posted on eLearning: <http://lss.at.ufl.edu>. All lectures for this course are narrated presentations and may include some videos and/or supplemental reading. Any material posted online (including any posted manuscripts) may be included in the tests, even if I do not cover the material specifically in my narrated presentations. Not all information covered during the narrated presentations will exist as printed material on lecture slides. Therefore, you should pay close attention to the narrated lectures as knowing the spoken information is critical for success in this course. All lectures and tests will be delivered online in Canvas! There will be no classroom lecture meetings.

Throughout the course, you will view video and Flash course lectures. Please understand that many of these video clips and photographs are copyrighted and are NOT to be used outside of this class and only may be used this semester. Please do not copy or distribute these photographs or video clips. All class notes are provided for educational use only and are not to be distributed.

Evaluation: The course grade is based on total points earned (out of 350 possible points).

-Test 1	100 pts
-Test 2	100 pts
-Test 3	100 pts
-Beekeeping Report	50 pts

Total Points: ENY 4573 350 pts

Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

FINAL GRADING		
% grade	Letter grade	Points needed to achieve letter grade
100-93	A	≥326
90-92	A-	315-325
87-89	B+	305-314
83-86	B	291-304
80-82	B-	280-290
77-79	C+	270-279
73-76	C	256-269
70-72	C-	245-255
67-69	D+	235-244
63-66	D	221-234
60-62	D-	210-220
0-59	E	0-209

Course Schedule: Since this course is offered via Canvas as a distance education course, students may work at their own pace. However, students are expected to complete chapters 1-8 by the first test, chapters 1-16 by the second test, and 1-24 by the third test. All tests are cumulative. Test III is the “final” and will be administered during finals week.

Week	Date	Topics Covered and Assignment/Test Date
Week 1	5 – 8 January	Lecture 1. An Introduction to the Hymenopterans and Bees Lecture 2. Sociality and Honey Bees
Week 2	11 – 15 January	Lecture 3. Biogeography of Honey Bees Lecture 4. Honey Bee Anatomy -Syllabus Quiz Due – 15 January 2016, 5:00 pm ET
Week 3	18 – 22 January	Lecture 5. Honey Bee Physiology Lecture 6. Nutrition and Immune Response
Week 4	25 – 29 January	Lecture 7. Honey Bee Biology Lecture 8. Honey Bee Colonies as a Superorganism
Week 5	1 – 5 February	-Test I (Lectures 1 – 8): 1 - 2 February 2016 Lecture 9: The History of Beekeeping Lecture 10: Beekeeping Equipment
Week 6	8 – 12 February	Lecture 11: Getting Started in Beekeeping Lecture 12: Pests and Predators of Honey Bees -Last Day to submit your response for Field Day Attendance/Shadowing a Beekeeper activity – 8 February 2016, 5:00 pm ET -Field Day at UF Bee Biology Unit – 13 February 2016
Week 7	15 – 19 February	Lecture 13: Pathogens and Diseases of Honey Bees
Week 8	22– 26 February	Lecture 14: Integrated Pest Management in Apiculture -Beekeeping Reports Due – 26 February, 5:00 pm ET
Week 9	29 February – 4 March	Spring Break
Week 10	7 – 11 March	Lecture 15: Yearly Beekeeping Management I: April - August Lecture 16. Yearly Beekeeping Management II: September - March
Week 11	14 – 18 March	- Test II (Lectures 1 – 16): 14 – 15 March 2016 Lecture 17. History and Theory of Honey Production
Week 12	21 – 25 March	Lecture 18. Other Products of the Hive Lecture 19. Bee Botany
Week 13	28 March – 1 April	Lecture 20. Pollination Ecology Lecture 21. Queen and Packaged Bee Production
Week 14	4 – 8 April	Lecture 22. African Honey Bees Lecture 23. Colony Collapse Disorder (CCD)
Week 15	11 – 15 April	Lecture 24. Research and Extension Efforts in Apiculture
Week 16	18 – 20 April	-Test III (Final Test – all Lectures): 18 – 19 April 2016

Tests: There will be three, 100 point tests during the semester. Tests will be true/false and multiple choice and will be taken electronically. All tests are cumulative and will be offered online through Canvas. **Tests will be timed (75 minutes allowed) and administered on set dates.** You should take every opportunity to adhere to the suggested chapter review timeline above so that you are prepared for the tests. There is a large bank of test questions for each test and the test questions are selected randomly

for each student. You must log in to take the test within the 24 hour period given below for each test. Once you begin the test, it must be submitted within 75 minutes. **All test times are given in Eastern Time.**

	Test Opens	Test Closes
Test 1:	12:00 pm ET, 1 February	12:00 pm ET, 2 February
Test 2:	12:00 pm ET, 14 March	12:00 pm ET, 15 March
Test 3:	12:00 pm ET, 18 April	12:00 pm ET, 19 April

You need to read the syllabus and answer 3 questions on Canvas by 5:00 pm ET 15 January 2016 (this is not an extra credit assignment but rather a requirement). This will show you how your online tests will be formatted. Please make an appointment to see me as soon as possible if you are uncomfortable with online lectures, tests and assignments. Go to Tests & Quizzes on the left of the main page to take this short quiz.

Beekeeping Report: One of the most useful skills in any profession is writing. As such, you are expected to produce a 4-5 page (max!!!) written report (12 point, Times New Roman font, double spaced) by participating in one of two activities (shadow a beekeeper or attend the beekeeping field day).

Regardless of which activity you choose, you must submit a response to the “Field Day Attendance/Shadowing a Beekeeper Activity” Canvas assignment by 8 February 2016 at 5:00 pm ET. No points are awarded for notifying the instructor/TA of your choice, but 5 points will be deducted from your Beekeeping Report grade every day you fail to notify the instructor/TA past the deadline (the deductions will be assessed on the final report grade). Students living within 2 hours drive of Gainesville, FL are expected to make every effort to attend the field day.

1) You can attend the Honey Bees and Beekeeping Field Day hosted at the University of Florida Honey Bee Biology Unit in Gainesville, FL. **13 February 2016 (Saturday)**, we will host a field day during which students will construct beekeeping equipment, work live honey bee colonies, extract honey, etc. The laboratory will begin at 9:00 am and conclude at 3:00 pm (pizza lunch provided). Participants must wear socks and close-toed shoes. Following the Field Day, students must write a 4-5 page report on their experience with honey bees and beekeeping during the event. **Students planning on attending the field day must submit a response to the “Field Day Attendance/Shadowing a Beekeeper Activity” Canvas assignment by 8 February 2016 at 5:00 pm ET.** A map and driving directions to the UF Bee Biology Unit will be provided after registration closes. **No family, friends, spouses, etc. are allowed to attend the field day.**

2) You can shadow a beekeeper and write report on his/her beekeeping operation. You can discuss how the operation is managed, what the purpose of the operation is (pollination, honey production, etc.), key obstacles the beekeeper has to overcome in his/her operation, etc. Your visit with the beekeeper should be photo-documented (you can include photos as figures in the report, though they must be in addition to the 4-5 pages of text). Please contact the Instructor or TA if you need help finding a local beekeeper in your area. **Furthermore, you must submit a response to the “Field Day Attendance/Shadowing a Beekeeper Activity” Canvas assignment by 8 February 2016 at 5:00 pm ET.** This option is mainly intended for students who are unable to attend the field day because (1) they live too far from Gainesville or (2) they have a previously-scheduled, legitimate engagement elsewhere that day.

A grading rubric has been provided at the end of this syllabus to facilitate development of the beekeeping report. Five points will be deducted from reports every day past the due date (25 February 2016; 5:00 pm ET) that the report is submitted, regardless of the excuse. Please do not wait until the last minute to produce your report. Again, the report is due 26 February 2016 at 5:00 pm ET.

Make-up Policy: *There will be no make-up for tests or other assignments missed without prior approval from the instructor. Unexcused, missed tests will be assigned a grade assignment of 0.* If you would like to take your test on a day *prior* to the listed test date, please contact the instructors at **least one week in advance**. Tests can be taken in advance of the scheduled date only under special circumstances. ***You will not be allowed to take the test after the assigned test date.*** If you are ill, you need to contact the instructor or TA before the test. A doctor or infirmary must confirm illness before you may schedule a make-up test. You will be required to provide appropriate written documentation to make up a missed examination (e.g., from a doctor in case of severe illness or a funeral notice or obituary in the unfortunate event of the death of a close relative/friend). Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Class Attendance 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: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>. This is a distance education course so attendance is not required.

Online 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. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

Academic Honesty

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."* 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: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

We, the members of the University of Florida, pledge to hold ourselves and peers to the highest standards of honesty and integrity.

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, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/*
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching
- *Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/*

For issues with technical difficulties for E-learning in Canvas: Please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

** Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

University Policy on Accommodating Students with Disabilities: Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

UF Policy on E-mail: "Official University business email will be communicated to students using the University GatorLink email account. That is, official email will be sent exclusively to GatorLinkUserName@ufl.edu. The preferred email address recorded for all students will be the GatorLink address. This is the email address displayed in the online phonebook. Students may continue to use the forwarding mechanism to deliver their email to other mail services, if they wish. However, it is the student's responsibility to insure that the forwarding address is current so that they receive official communications from the University".

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.

Plagiarism: Plagiarism is a serious problem in academia today, especially with the ease of obtaining information from the World Wide Web. Plagiarism is defined as representing the words or ideas of another person as one's own, without attribution to the source. All words and ideas must be attributed to a source unless they are considered common knowledge (i.e., widely known by many people and found in many different sources). There are many kinds of plagiarism, as you will read on the Guide to Plagiarism website referenced below.

Plagiarism is unethical, unacceptable in science, and prohibited by the UF Student Honor Code (<http://www.dso.ufl.edu/sccr/honorcode.php>). The consequences for plagiarism while at the University of Florida range from receiving a grade of zero for the plagiarized assignment or a failing grade for the course, to, for repeated offenses, expulsion from the university. Plagiarism after graduate training calls into question one's scientific integrity and can lead to banning of publication in journals and the loss of jobs/careers.

In some countries, it is an acceptable practice to write in a manner that faculty members at the University of Florida consider to be plagiarism. Students studying in our university and with plans to publish their research in the English language need to know what plagiarism is and how to avoid it.

Students who plagiarize will be caught and consequences will be applied. I check all written assignments using an anti-plagiarism software called Turnitin® (<https://lss.at.ufl.edu/help/Turnitin>). Students who plagiarize will receive a grade of zero on the assignment. The second instance of plagiarism in the course will result in an automatic failing grade in the course.

For further information and examples of plagiarism, I strongly suggest that you please read the George Smathers' Library Guide to Plagiarism <http://www.uflib.ufl.edu/msl/07b/students.html>.

Please understand that our purpose in bringing to your attention the matter of plagiarism is to help train you to be ethical scientists, not to impugn your character.

Student Complaint Process: 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. Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

Beekeeping Report Rubric

CATEGORY	Point Value ¹				
	8	6	4	2	0
Components of the report²	All required elements are present and additional elements that add to the report (e.g., thoughtful comments, graphics) have been added.	All required elements are present.	One required element is missing, but additional elements that add to the report (e.g., thoughtful comments, graphics) have been added.	2-3 required elements are missing.	>4 required elements are missing.
Spelling, Punctuation and Grammar	One or fewer errors in spelling, punctuation and grammar in the report.	Two or three errors in spelling, punctuation and grammar in the report.	Four or five errors in spelling, punctuation and grammar in the report.	Five or six errors in spelling, punctuation and grammar in the report.	>6 errors in spelling, punctuation and grammar in the report.
Appearance and Organization	Lab report uses headings and subheadings to visually organize the material. Additional steps have been taken to make the report visually pleasing.	Lab report uses headings and subheadings to visually organize the material. Some additional steps have been taken to make the report visually pleasing.	Lab report formatting does not help visually organize the material.	Lab report is typed but looks sloppy, with poor formatting and poor organization.	Lab report is handwritten, sloppy, illegible, and poorly formatted and organized.
Beekeeping Concepts³	Report illustrates an accurate and thorough understanding of beekeeping concepts outlined during the field day or visit with a beekeeper.	Report illustrates an accurate understanding of most beekeeping concepts outlined during the field day or visit with a beekeeper.	Report illustrates a limited understanding of beekeeping concepts outlined during the field day or visit with a beekeeper.	Report illustrates inaccurate understanding of beekeeping concepts outlined during the field day or visit with a beekeeper.	Report illustrates no understanding of beekeeping concepts outlined during the field day or visit with a beekeeper.

Beekeeping Jargon ⁴	Report illustrates an accurate knowledge and use of jargon associated with beekeeping. The student uses all jargon correctly.	Report illustrates an accurate knowledge and use of most jargon associated with beekeeping. The student uses most jargon correctly.	Report illustrates a limited knowledge and use of jargon associated with beekeeping. The student uses only some jargon correctly.	Report illustrates incomplete knowledge and use of jargon associated with beekeeping. The student regularly misuses beekeeping-related jargon.	Report illustrates no knowledge and/or use of jargon associated with beekeeping. The student always misuses beekeeping-related jargon.
Summary	Summary describes the skills learned, the information learned and some future applications to real life situations.	Summary describes the information learned and a possible application to a real life situation.	Summary describes the information learned.	The summary is poorly written and fails to describe the information learned.	The summary is absent.

¹**Point Value:** All reports start with 2 points. So, there are 48 additional points that can be obtained (totaling 50 points). Intermediate points can be assigned. For example, if a student's use of beekeeping jargon lies between the highest (8 points) and 2nd highest (6 points) point values, 7 points will be awarded for that category as appropriate.

²**Components of the Report:** The report must include a title, student name and email address, page numbers, photographs and/or figures, and introductory, supporting (or body), and conclusion paragraphs. The report must conclude in a 1/2 –page summary. The text of the report must be 4-5 double spaced pages long. It should be formatted in 12-point, Times New Roman Font.

³**Beekeeping Concepts:** This includes topics such as honey extraction, equipment assembly, disease and pest recognition, lighting smokers, appropriate use of clothing worn by beekeepers for protection, etc.

⁴**Beekeeping Jargon:** The technical terminology associated with beekeeping and apiculture. Does the student demonstrate knowledge of beekeeping jargon by using it correctly?

Some additional questions that will help you develop the report: Does the student use accepted terminology rather than colloquialisms? Does the student demonstrate breadth and depth of knowledge about the topic? Do they demonstrate clearly that they understand apiculture and its practice? Do they include information garnered from multiple, reliable sources? Does the manuscript flow logically? Does it tell a story or, is it scattered in thought, jumping from one topic to the next? Do all paragraphs begin with introductory sentences and have supporting sentences that stick to the theme? Does one paragraph flow directly into the next? Are the sentences readable? Do the students use proper subject and verb agreement? Do sentences end in prepositions? Does the student split verbs? What is the overall writing quality?