

Cover Sheet: Request 14131

ENY4573 Beekeeping

Info

Process	Course Modify Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Cameron Jack cjack@ufl.edu
Created	8/14/2019 2:34:31 PM
Updated	11/9/2019 8:05:59 AM
Description of request	I would like to change the name of Beekeeping to Beekeeping I, as I am now requesting two online Beekeeping courses. Further, I would like to remove several topics from this course and place more emphasis on the nature of beekeeping. This will require a modification of course topics and the recording of new lectures.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Entomology and Nematology 514914000	Heather Mcauslane		8/14/2019
ENY 4573 Syllabus Summer 2019.docx					8/14/2019
College	Approved	CALS - College of Agricultural and Life Sciences	Joel H Brendemuhl	Edits requested by the CALS CC have been addressed. This will now be a joint offered course with ENY 6XXX - Apiculture I request # 14307 that is pending at the GCC.	10/17/2019
Beekeeping I vs. Apiculture I.docx					10/2/2019
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			10/17/2019
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|Modify for request 14131

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Description of request: I would like to change the name of Beekeeping to Beekeeping I, as I am now requesting two online Beekeeping courses. Further, I would like to remove several topics from this course and place more emphasis on the nature of beekeeping. This will require a modification of course topics and the recording of new lectures.

Submitter: Cameron Jack cjack@ufl.edu

Created: 10/3/2019 8:17:48 AM

Form version: 3

Responses

Current Prefix ENY

Course Level 4

Number 573

Lab Code None

Course Title Beekeeping

Effective Term Summer

Effective Year 2020

Requested Action Other (selecting this option opens additional form fields below)

Change Course Prefix? No

Change Course Level? No

Change Course Number? No

Change Lab Code? No

Change Course Title? Yes

Current Course Title Beekeeping

Proposed Course Title Beekeeping I

Change Transcript Title? Yes

Current Transcript Title Beekeeping

Proposed Transcript Title (21 char. max) Beekeeping I

Change Credit Hours? No

Change Variable Credit? No

Change S/U Only? No

Change Contact Type? No

Change Rotating Topic Designation? No

Change Repeatable Credit? No

Maximum Repeatable Credits 0

Change Course Description? Yes

Current 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.

Proposed Course Description (50 words max) The biology of honey bees and the craft of apiculture will be examined by exploring the life cycle of honey bees, biogeography and evolution of beekeeping. Equipment, techniques, management practices, pollination ecology, economic practices and current issues within beekeeping will be discussed.

Change Prerequisites? Yes

Current Prerequisites Junior standing or higher

Proposed Prerequisites (BSC 2005)

Change Co-requisites? No

Rationale The current Beekeeping course covers many topics, but does not get into much depth. I would like to focus more on the craft of beekeeping and get into more detail on few topics. I would also like to open the course for more students earlier in their educational programs.

Differences Between the Beekeeping I and Apicultural I Courses

Extension Project

Students enrolled in ENY 6XXX Apiculture I are required to produce an additional extension project which may be in the form of one of three activities (Featured Creatures article (<http://entnemdept.ufl.edu/creatures/>), EDIS document (<http://edis.ifas.ufl.edu/>) or an instructional video). Regardless of which type of extension project they choose, it should have the potential for publication through the University of Florida's extension branch (Cooperative Extension Service). Thus, it is held to a higher standard of writing and effort than from the undergraduate students. The extension project has several deadlines in relation to the project and requires a peer review from other graduate students.

**ENY 4XXX
Beekeeping I
Summer 2020
3 credits**

*This course is co-taught with ENY 6XXX Apiculture I.

Lead-Instructor: Cameron Jack, MSc
Office Room #: ENY (Bldg 964), room 114
Office Address: Steinmetz Hall, Natural Area Drive, P.O. Box 110620, Gainesville, FL 32611
Office Phone #: 352-294-6926 (*Please email to set up a phone appointment.*)
E-mail: cjack@ufl.edu

Instructor: Jamie Ellis, PhD
Office Room #: ENY (Bldg 964), room 116
Office Address: Steinmetz Hall, Natural Area Drive, P.O. Box 110620, Gainesville, FL 32611
Office Phone #: 352-273-3924 (*Please email to set up a phone appointment.*)
E-mail: jdellis@ufl.edu
Website: www.ufhoneybee.com

TA: TBA
Office Room #:
Office Address:
E-mail:

Special Note on Contact via Email: Due to UF privacy laws, you must use your GatorLink account or the Canvas mail system when emailing the Instructor or TA. Emails sent from other accounts (gmail, hotmail, etc.) will not be answered by the Instructor or TA.

Office Hours: By appointment.

Course Description: The biology of honey bees and the craft of apiculture will be examined by exploring the life cycle of honey bees, biogeography and evolution of beekeeping. Equipment, techniques, management practices, pollination ecology, economic practices and current issues within beekeeping will be discussed.

Course Learning Objectives:

1. Identify the different members of a honey bee colony and discuss their different roles within the honey bee nest.
2. Summarize the innovations through history that have shaped our modern beekeeping practices.
3. Recognize the essential pieces of equipment in beekeeping and explain their uses.
4. Discuss the basic management practices used throughout the year and relate how these practices achieve the goals of the beekeeper.
5. Compare honey bees to other pollinators and summarize their economic importance.
6. Identify the valuable and dangerous honey plants of Florida.

7. Discuss the impacts of common stressors to honey bee colonies and describe how to manage them.

Required Readings:

1. Textbook: Caron, D.W. 2013 (revised from 1999). Honey Bee Biology and Beekeeping. Wicwas Press. Cheshire, CT, 368 pp.
2. American Bee Journal articles written by Dr. Jamie Ellis which are appropriate for the content of this course.

Lectures: This is a fully 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 will include videos and supplemental readings. We will provide text from all the narrated presentations, but you should pay close attention, as knowing and understanding the spoken information is critical for success in this course. All lectures and tests will be delivered online in Canvas.

Please note that all video clips and photographs are copyrighted and are NOT to be used outside of this class and may be used only this semester. Please do not copy or distribute these photographs or video clips. All class notes are provided for educational use only.

Course Notifications and Communication: All course communications (assignments, announcements, test information, etc.) will be made via the Announcements in Canvas. Please ensure that your Canvas profile is set to receive notifications (i.e. please check the appropriate box to receive all notifications). To do this, click on your name in the upper right corner of the Canvas homepage after logging into Canvas. Next, click “notifications” on the left. This will take you to the Notification Preferences page. Then, click the check symbol for at least the following notifications: Due Date, Course Content, Announcement, and Grading.

Course Schedule: This course is offered via Canvas as a distance education course. To stay on track, students must adhere to the course schedule.

Module	Video Content	Required Readings	Module Assessments	Critical Thinking Exercises	Beekeeping Experience Report
Getting Started	Syllabus, course orientation, tips for success	Course syllabus; Tips for success	Syllabus quiz May 15 th		
Bees and Beekeeping	Why keep honey bees?	Textbook: p. 9-15; 22-25. ABJ: Members of a colony; Honey bee stings.	Bees and Beekeeping quiz May 22 nd		
	Educational resources for beekeepers				
	Naming the bee				
	What to do about honey bee stings?				
	Differentiating bees and wasps				
	Common bee groups				
Honey Bee Biology	Adult members of a honey bee colony	Textbook: p. 49-57; 61-73. ABJ: Honey bee biology; Worker tasks; Swarms.	Honey Bee Biology quiz May 29 th	Critical Thinking Exercise 1 May 29 th	RSVP for Beekeeping Field Day Activity May 29 th
	Immature members of honey bee colony				
	Components of a honey bee nest				
	Life Cycle of a honey bee colony				
	Tasks of honey bee workers				
	Honey bee dance language				
	Honey bee thermoregulation				
Evolution of beekeeping	Ancient honey bee/human interactions	Textbook: p. 13-19. ABJ: Langstroth Hive; Time commitment of beekeeping.	Evolution of Beekeeping quiz June 5 th		Beekeeping Field Day Activity June 6 th
	The evolution of beekeeping				
	The golden age of beekeeping				
	Beekeeping today				
	Making money with beekeeping				
Beekeeping equipment	The parts of a Langstroth hive	Textbook: p. 159-165. ABJ: Hive tool and smoker; Protective equipment.	Equipment quiz June 12 th		
	Frames and foundation				
	Three essential beekeeping tools				
	Other beekeeping equipment				
	Alternative hive types and sizes				
	Assembling hive equipment				
Getting Started with Beekeeping	Hive choice and configuration	Textbook: p. 177-195. ABJ: Choosing an apiary site; Beekeeping goals.	Getting Started in Beekeeping quiz June 19 th	Critical Thinking Exercise 2 June 19 th	
	Starting a new honey bee colony				
	Monetary and time requirements of beekeeping				
	Rules and regulations for keeping honey bees				
	Your bees and other people				
	Qualities of a good apiary location				

Beekeeping Basics	Characteristics of a healthy colony	Textbook: p. 115-126; 232-235. ABJ: Inspecting new colonies; Installing packages and nucs.	Beekeeping Basics quiz July 3 rd	Critical Thinking Exercise 3 July 3 rd	
	How to light a smoker				
	Proper colony inspection techniques				
	Installing packages and nucs				
	Marking and clipping queens				
	Requeening				
	Basic swarm management techniques				
	Making splits				
	Feeding bees				
	Moving bees				
Pollination	Flower anatomy, pollen, and nectar	Textbook: 289-305. ABJ: Making money with bees.	Pollination quiz July 10 th		Beekeeping Report Due July 10 th
	Pollination Ecology				
	Who are the pollinators?				
	Bees as super pollinators				
	Pollination with honey bees				
Production and Selling of Honey	How bees make honey	Textbook: 237-252. ABJ: Honey extraction and bottling equipment.	Honey Production and Selling quiz July 24 th	Critical Thinking Exercise 4 July 24 th	Peer Reviews of Beekeeping Report July 17 th
	Optimum Foraging Theory				
	Managing for honey production				
	Monofloral honey				
	Wildflower honey				
	Bad/good honey plants				
	Harvesting honey				
	Honey house rules				
	Honey processing/handling equipment				
	Extracting honey				
	Bottling honey				
	Other honey products				
Labeling and selling honey					
Colony Stressors and Yearly Management	Major arthropod pests of honey bee colonies	Textbook: 205-221; 223-230. ABJ: Biotic stressors; Other stressors.	Colony Stressors and Yearly Management quiz July 31 st	Critical Thinking Exercise 5 July 31 st	
	Minor arthropod & other pests of honey bee colonies				
	Pathogen stressors of honey bee colonies				
	Other stressors of honey bee colonies				
	Principle stressors of honey bee colonies				
	Spring and summer management				
	Fall and winter management				

Evaluation: The course grade is based on total points earned out of 500 possible points.

Module assessments	25 points each × 10 assessments	250 points
Section critical thinking exercises	35 points each × 5 exercises	175 points
Beekeeping experience RSVP	5 points	5 points
Submission of your peer evaluations of two of your peers' beekeeping reports	10 points × 2 peer reviews (you get 10 points per peer review you submit)	20 points
Peer evaluation of your beekeeping report (two of your peers' evaluations of your report)	25 points × 2 peer reviews	50 points
	Total Course Points	500 points

Grades and Grade Points

For information on current UF policies for assigning grade points, see catalog.ufl.edu/UGRD/academic-regulations/grades-gradingpolicies/.

FINAL GRADING		
% grade	Letter grade	Points needed to achieve letter grade
100-93	A	≥ 465
90-92	A-	450 – 464
87-89	B+	435 – 449
83-86	B	415 – 434
80-82	B-	400 – 414
77-79	C+	385 – 399
73-76	C	365 – 384
70-72	C-	350 – 364
67-69	D+	335 – 349
63-66	D	315 – 334
60-62	D-	300 – 314
0-59	E	0 – 299

Assignments:

(1) Module Assessments: There is a 25-point assessment associated with each of the ten modules in this course. These assessments are *open note* (i.e. you are allowed to use class lectures, books, websites, etc. while taking the assessments). The assessments will be composed of true/false and multiple choice questions. **The assessments 1) open the Saturday morning after the previous section ends, 2) are timed (60 minutes each), and 3) are due at 11:59 pm on the date listed in the course schedule.** These are individual assessments so please do your own work and do not work in groups or share your answers. There is a large bank of test questions for each assessment and the assessment questions are selected randomly for each student. You will receive a 5-point deduction for each day a module assessment is late.

The first module assessment is a graded syllabus quiz on the “Getting Started” module. You need to read the syllabus and answer quiz questions related to it by **11:59 pm ET on the date listed in**

the course schedule. You must complete the syllabus quiz before you are able to advance to the next module. This quiz will show you how your online assessments will be formatted as well as allow you to demonstrate that you understand how this course works and important due dates.

(2) Critical Thinking Exercises: The 10 modules are arranged into five sections. There is a critical thinking exercise associated with each section. The exercises are designed to encourage you to think critically about the content presented in the module lectures. The critical thinking exercises are worth 35 points each. These are individual exercises so please do your own work and do not work in groups or share your answers. All of the critical thinking exercises are open note and untimed. You can close and reopen the exercise as many times as you would like until the due date (see course schedule), but you will not be able to make any changes once you have officially submitted your final exercise. **The exercises will be available only during the section open period (see course schedule), are due at 11:59 pm on the date listed in the course schedule.** You will receive a 5 deduction for each day a module assessment is late.

(3) Beekeeping Report: One of the most useful skills in any profession is writing. As such, you are expected to produce a 4-5 page (maximum) written report (12 point, Times New Roman font, double spaced) by participating in one of three activities (attend the Beekeeping Field Day, attend three Honey Bee Club meetings or shadow a beekeeper). Regardless of which activity you choose, you must RSVP and take a sting quiz by the date listed on the course schedule. Students electing to shadow a beekeeper must include the beekeeper's name and phone number when registering for this option.

Your three options:

1) You can attend the Beekeeping Field Day hosted at the University of Florida Honey Bee Research Building (just east of Charles Steinmetz Hall) in Gainesville, FL. On one Saturday during the semester (see the course schedule for the date), we host a field day during which students construct beekeeping equipment, work live honey bee colonies, extract honey, etc. The field day begins at 9:00 am and concludes around 12:30 pm. Participants must wear socks and close-toed shoes. Long sleeve shirts and pants are encouraged. Please do not wear any dark colored clothes (black, navy, etc.). Following the Field Day, students must write a 4-5 page report on their experience with honey bees and beekeeping during the event. A map and driving direction to the UF Bee Biology Unit are available on the Canvas Course site. No family, friends, spouses, etc. are allowed to attend the field day.

2) You can choose to attend three Honey Bee Club meetings during the semester. The UF Honey Bee Club is a student-led organization which practices and discusses apiculture. Meetings are generally held every other Thursday evening at 5:00 pm at the Honey Bee Research Building (Bldg 960). If you elect to fulfill your beekeeping experience requirement in this manner, you must attend **at least three meetings**. If you only attend two meetings, it will not count towards your required beekeeping experience and you will need to fulfill your requirement by attending the Field Day or shadowing a beekeeper. It is critical that you sign your name on the attendance sheet as soon as you arrive at the meetings and participate fully. If you decide to go this route, you should start attending meetings as soon as possible to ensure you meet the requirement before the due date of the Beekeeping Report. After attending three meetings, students must

write a 4-5 page report on their experiences with honey bees and beekeeping during the meetings.

3) 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 must overcome in his/her operation, etc. Your visit with the beekeeper should be photo-documented (you can/should include photos as figures in the report, though they must be in addition to the 4-5 pages of text). You will receive a score of 0 on the beekeeping report/peer evaluation if you do not shadow the beekeeper in person. This option is mainly intended for students who are unable to attend the field day or attend Honey Bee Club meetings because (1) they live too far from Gainesville or (2) they have a previously-scheduled, legitimate engagements elsewhere during those times. Finding a beekeeper to shadow can take time. Please make every effort to contact a beekeeper by the Beekeeping Experience RSVP (see course schedule for date) so that you can shadow the beekeeper well before the Beekeeping Report is due. Almost every country, region, state, etc. has a beekeepers' association. The best way to find a beekeeper in your area is do an internet search for "your country/state/region/etc. beekeepers association". For example: "Florida Beekeepers Association," "New Zealand Beekeepers Association," "Jacksonville Beekeepers Association," etc. From the website(s) you find, look for the given association's list of contacts, officers, members, etc. and contact one of them to explain your assignment and request a visit. At the end of the day, you have the same resources available to find beekeepers in your area that the Instructor and TAs have. Thus, the responsibility of finding a beekeeper lies with the student who elects to shadow a beekeeper. That said, please contact the Instructor or TA if you need help finding a local beekeeper in your area after exhausting other options.

A grading rubric will be provided to facilitate development and peer review of the beekeeping report. **Five points will be deducted from reports every day past the due date (see the course schedule) that the report is submitted, regardless of the excuse.** Please do not wait until the last minute to produce your 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.

The beekeeping report grade (up to 75 pts) is composed of three components.

1) 5 points for the RSVP and sting quiz – You must RSVP for the beekeeping field day and take a sting quiz by the due date noted in the course schedule.

2) 20 points for submitting your peer evaluations of two other students' reports (10 points per report) – After submission of all students' beekeeping reports, you will be randomly assigned two other students' beekeeping reports to peer evaluate using the rubric at the end of this syllabus. You get 10 points per peer review you submit (up to two peer reviews). You will be awarded 0, 10, and 20 points for submitting zero, one or two peer reviews respectively. Your evaluations of two of your peer's reports are due by the date listed in the course schedule.

3) 40 points for your peers' reviews of your beekeeping report – You can receive up to 50 points for the beekeeping report you write and submit. Two students in the class will review your beekeeping report and individually assign a score of 0 – 20 using the beekeeping report rubric at the end of this syllabus. The two scores will be summed to produce the total score for your beekeeping report. Instructors and class TA's will try to detect inconsistencies between peer reviewers, if any.

4) 10 points from the Instructor or TA's reviews of your beekeeping report – The Instructor or TA reviewing the grades assigned to your Beekeeping Report will also read your report to ensure that your peer reviewers graded the report fairly and correctly.

Absences and Make-Up Work: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Online Course Evaluation Process: 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 gatorevals.aa.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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

Academic Honesty: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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.” The Honor Code (sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Services for Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, dso.ufl.edu/drc) 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.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact <mailto:umatter@ufl.edu>, 352-392-1575, or visit 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 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 shcc.ufl.edu/.

University Police Department: Visit 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; ufhealth.org/emergency-room-trauma-center.

Academic Resources

E-learning technical support: Contact the [UF Computing Help Desk](http://ufcomputinghelpdesk.com) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services career.ufl.edu/.

Library Support: cms.uflib.ufl.edu/ask various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring. teachingcenter.ufl.edu/

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. writing.ufl.edu/writing-studio/

Student Complaints On-Campus: sccr.dso.ufl.edu/policies/student-honor-codestudent-conduct-code/

On-Line Students Complaints: distance.ufl.edu/student-complaint-process/

ENY 4573

Beekeeping

↑ Summer 2019
3 credits

Instructor: Cameron Jack, MSc

Office Room #: ENY (Bldg 964), room 114

Office Address: Honey Bee Laboratory, Natural Area Drive, P.O. Box 110620, Gainesville, FL 32611

Office Phone #: 352-294-6926 (Please email to set up a phone appointment.)

E-mail: cjack@ufl.edu

Lead-TA: Emily Noordyke (Graduate Students)

Office Room #: ENY (Bldg 964), room 110

Office Address: Steinmetz Hall, Natural Area Drive, P.O. Box 110620, Gainesville, FL 32611

E-mail: enoordyke@ufl.edu

TA: Brynn Johnson (Undergraduate students last name A-K)

E-mail: brynnjohnson@ufl.edu

TA: Kaylin Kleckner (Undergraduate students last name L-Z)

E-mail: kaylin.kleckner@ufl.edu

Special Note on Contact via Email: Due to UF privacy laws, you must use your GatorLink account or the Canvas mail system when emailing the Instructor or TA's. Emails sent from other accounts (gmail, hotmail, etc.) will not be answered by the Instructor or TA's.

Office Hours: Due to Mr. Jack's travel schedules, office hours and phone meetings are available only by email appointment. The Honey Bee Research Facility is next to the Entomology and Nematology building named Charles Steinmetz Hall (Building 970) (<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 principles, 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 superorganism colony 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 4573: Apiculture.

Recommended Readings (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.

3. Supplemental Information (documents, videos, etc.) that further explains the concepts taught is provided for each module.

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. 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 and understanding 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 may be used only 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.

Course Notifications and Communication: All course communications (assignments, announcements, test information, etc.) will be made via the Announcements and Email functions of Canvas. Please ensure that your Canvas profile is set to receive notifications (i.e. please check the appropriate box to receive all notifications). To do this, click on your name in the upper right corner of the Canvas homepage after logging into Canvas. Next, click “notifications” on the left. This will take you to the Notification Preferences page. Then, click the check symbol for at least the following notifications: Due Date, Course Content, Announcement, and Grading.

Course Schedule: This course is offered via Canvas as a distance education course. To stay on track, students must adhere to the course schedule.

Section	Module	Week(s)	Content (Lecture # and Title)	Module Assessment Due
Getting Started	Getting Started	1	syllabus, course orientation, tips for success	Syllabus quiz 17 May
1	1 – Phylogeny and Biogeography	2	1 – An introduction to hymenopterans and bees	24 May
			2 – Sociality and honey bees	
			3 – Biogeography of honey bees	
2	2 – Anatomy and Physiology	3	4 – Honey bee anatomy	31 May
			5 – Honey bee physiology	
			6 – Nutrition and Immune Response	
	3 – Biology	4	7 – Honey bee biology	7 June
8 – Honey bee colonies as a superorganism				
3	4 – Beekeeping	5	9 – The history of beekeeping	14 June
			10 – Beekeeping equipment	
			11 – Getting started in beekeeping	
	5 – Pests Predators & Pathogens	6	12 – Pests and predators of honey bees	21 June
			13 – Pathogens and disease of honey bees	
	6 – Management Strategies	7/8	14 – Integrated pest management in apiculture	5 July
15 and 16 – Yearly beekeeping management				
4	7 – Hive Products	9	17 – History and theory of honey production	12 July
			18 – Other products of the hive	
	8 – Ecosystem Services	10	19 – Bee botany	19 July
			20 – Pollination ecology	
5	9 – Breeding and African honey bees	11	21 – Queen and package bee production	27 July
			22 – African honey bees	
	10 – CCD, Research, and Extension	12	23 – Colony collapse disorder (CCD)	2 August
			24 – Research and extension efforts in apiculture	

Evaluation: The course grade is based on total points earned out of 500 possible points.

Module assessments	25 points each × 10 assessments	250 points
Section critical thinking exercises	35 points each × 5 exercises	175 points
Beekeeping experience RSVP	5 points	5 points
Submission of your peer evaluations of two of your peers’ beekeeping reports	10 points × 2 peer reviews (you get 10 points per peer review you submit)	20 points
Peer evaluation of your beekeeping report (two of your peers’ evaluations of your report)	25 points × 2 peer reviews	50 points

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
100-93	A	≥ 463
90-92	A-	448 – 462
87-89	B+	433 – 447
83-86	B	413 – 432
80-82	B-	398 – 412
77-79	C+	383 – 397
73-76	C	363 – 382
70-72	C-	348 – 362
67-69	D+	333 – 347
63-66	D	313 – 332
60-62	D-	298 – 312
0-59	E	0 – 297

Assignments:

(1) Syllabus Quiz: There is an ungraded syllabus quiz on the “Getting Started” page. You need to read the syllabus and answer quiz questions related to it by **11:59 pm ET on the date listed in the course schedule**. You must complete the syllabus quiz before you are able to advance to the next module. This quiz will show you how your online assessments will be formatted as well as allow you to demonstrate that you understand how this course works and important due dates. Go to “Getting Started” on the course homepage to review the syllabus and take this short quiz.

(2) Module Assessments: There is a 25 point assessment associated with each of the ten modules in this course. These assessments are *open note* (i.e. you are allowed to use class lectures, books, websites, etc. while taking the assessments). The assessments will be composed of true/false and multiple choice questions. **The assessments 1) open the Saturday morning after the previous section ends, 2) are timed (60 minutes each), and 3) are due at 11:59 pm on the date listed in the course schedule.** These are individual assessments so please do your own work and do not work in groups or share your answers. There is a large bank of test questions for each assessment and the assessment questions are selected randomly for each student. You will receive a 5 deduction for each day a module assessment is late.

(3) Critical Thinking Exercises: The 10 modules are arranged into five sections. There is a critical thinking exercise associated with each section. The exercises are designed to encourage you to think critically about the content presented in the module lectures. The critical thinking exercises are worth 35 points each. These are individual exercises so please do your own work and do not work in groups or share your answers. All of the critical thinking exercises are open note and untimed. You can close and reopen the exercise as many times as you would like until the due date (see course schedule), but you will not be able to make any changes once you have officially submitted your final exercise. **The exercises will be available only during the section open period (see course schedule), are due at 11:59 pm on the date listed in the course schedule.** You will receive a 5 deduction for each day a module assessment is late.

(4) Beekeeping Report: One of the most useful skills in any profession is writing. As such, you are expected to produce a 4-5 page (maximum) 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 RSVP and take a sting quiz by the date listed on the course schedule. Students living within 2 hours of Gainesville, FL are expected to make every effort to attend the field day. Students electing to shadow a beekeeper must include the beekeeper’s name and phone number when registering for this option.

Your two options:

1) You can attend the Beekeeping Field Day hosted at the University of Florida Honey Bee Laboratory (Bldg 964) in Gainesville, FL. On one Saturday during the semester (see the course schedule for the date), we host a field day during which students construct beekeeping equipment, work live honey bee colonies, extract honey, etc. The field day begins at 9:00 am and concludes at 2:00 pm. Participants must wear socks and close-toed shoes. Long sleeve shirts and pants are encouraged. Please do not wear any dark colored clothes (black, navy, etc.). Following the Field Day, students must write a 4-5 page report on their experience with honey bees and beekeeping during the event. A map and driving direction to the Honey Bee Laboratory are available on the Canvas course site. 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/should include photos as figures in the report, though they must be in addition to the 4-5 pages of text). You will receive a score of 0 on the beekeeping report/peer evaluation if you do not shadow the beekeeper in person. 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. Finding a beekeeper to shadow can take time. Please make every effort to contact a beekeeper by the Beekeeping Experience RSVP (see course schedule for date) so that you can shadow the beekeeper well before the Beekeeping Report is due. Almost every country, region, state, etc. has a beekeepers' association. The best way to find a beekeeper in your area is do an internet search for "your country/state/region/etc. beekeepers association". For example: "Florida Beekeepers Association," "New Zealand Beekeepers Association," "Jacksonville Beekeepers Association," etc. From the website(s) you find, look for the given association's list of contacts, officers, members, etc. and contact one of them to explain your assignment and request a visit. At the end of the day, you have the same resources available to find beekeepers in your area that the Instructor and TAs have. Thus, the responsibility of finding a beekeeper lies with the student who elects to shadow a beekeeper. That said, please contact the Instructor or TA if you need help finding a local beekeeper in your area after exhausting other options.

A grading rubric has been provided at the end of this syllabus to facilitate development and peer review of the beekeeping report. **Five points will be deducted from reports every day past the due date (see the course schedule) that the report is submitted, regardless of the excuse.** Please do not wait until the last minute to produce your 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.

The beekeeping report grade (up to 75 pts) is composed of three components.

- 1) 5 points for the RSVP and sting quiz – You must RSVP for the beekeeping field day and take a sting quiz by the due date noted in the course schedule.
- 2) 20 points for submitting your peer evaluations of two other students' reports (10 points per report) – After submission of all students' beekeeping reports, you will be randomly assigned two other students' beekeeping reports to peer evaluate using the rubric at the end of this syllabus. You get 10 points per peer review you submit (up to two peer reviews). You will be awarded 0, 10, and 20 points for submitting zero, one or two peer reviews respectively. Your evaluations of two of your peer's reports are due by the date listed in the course schedule.
- 3) 40 points for your peers' reviews of your beekeeping report – You can receive up to 50 points for the beekeeping report you write and submit. Two students in the class will review your beekeeping report and individually assign a score of 0 – 20 using the beekeeping report rubric at the end of this syllabus. The two scores will be summed to produce the total score for your beekeeping report. Instructors and class TA's will try to detect inconsistencies between peer reviewers, if any.
- 4) 10 points from the Instructor or TAs' reviews of your beekeeping report – The Instructor or TA reviewing the grades assigned to your Beekeeping Report will also read your report to ensure that your peer reviewers graded the report fairly and correctly.

Class Attendance and Make-Up Work: There will be no make-up for assessments, critical thinking exercises or other assignments missed without prior approval from the instructor. Unexcused, missed assignments will be assigned a grade assignment of 0. You will not be allowed to make up assignments after the due date unless extenuating circumstances or illness prohibited you from completing the assignment. You will be required to provide appropriate written documentation (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) to make up an assignment you failed to complete by the due date. Requirements for class attendance and make-up assignments 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/scer/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/*

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

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

- [Learning _ support @ ufl _ edu](mailto:Learning_support@ufl.edu)
- (352) 392-HELP - select option 2
- [https _://_ lss _ at _ ufl _ edu / help _.shtml](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.

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 requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

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; one of the most common ones is "insufficient paraphrasing", even with correct citation. Please look at the Purdue Online Writing Lab's web site on Avoiding Plagiarism (<https://owl.english.purdue.edu/owl/resource/589/01/>).

Plagiarism is unethical, unacceptable in science, and prohibited by the UF Student Honor Code (<http://www.dso.ufl.edu/scsr/honorcodes/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® (http://turnitin.com/en_us/products/originalitycheck). 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.

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 Components of the report 2	Point Value		
	5	4	3
	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 present but additional elements are added to the report (e.g., comments, graphics).
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.
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 format is not visually appealing.
Beekeeping Concepts 3	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 partial understanding of beekeeping concepts outlined during the field day or visit with a beekeeper.
<p>Point Value: There are 25 points that can be obtained per peer review (totaling 50 points when adding the two peer reviews).</p> <p>Components of the Report: The report must include a title, student name and email address, page numbers, photographs, and a conclusion. The report must conclude in a 1/2 –page summary. The text of the report must be 4-5 double spaced pages long.</p> <p>Beekeeping Concepts: This includes topics such as honey extraction, equipment assembly, disease and pest recognition, etc.</p>			

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?

Netiquette

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

Security

Remember that your password is the only thing protecting you from pranks or more serious harm.

- Do not share your password with anyone.
- Change your password if you think someone else might know it.
- Always logout when you are finished using the system.

General Guidelines

When communicating online, you should always:

- Treat your instructor with respect, even in email or in any other online communication.
- Always use your professors' proper title: Dr. or Prof., or if you in doubt use Mr. or Ms.
- Unless specifically invited, don't refer to them by first name.
 - Use clear and concise language.
 - Remember that all college level communication should have correct spelling and grammar.
 - Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you".
 - Use standard fonts such as Times New Roman and use a size 12 or 14 pt. font.
 - Avoid using the caps lock feature AS IT CAN BE INTERPRETTED AS YELLING.
 - Limit and possibly avoid the use of emoticons like :).
 - Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post and your message might be taken seriously or offensive.
 - Be careful with personal information (both yours and other's).
 - Do not send confidential patient information via e-mail.

Email Netiquette

When you send an email to your instructor, teaching assistant, or classmates, you should:

- Use a descriptive subject line.
- Be brief.
- Avoid attachments unless you are sure your recipients can open them.
- Avoid HTML in favor of plain text.
- Sign your message with your name and return e-mail address.
- Think before you send the e-mail to more than one person. Does everyone really need to see your message?
- Be sure you REALLY want everyone to receive your response when you click, "reply all."
- Be sure that the message author intended for the information to be passed along before you click the "forward" button.

ENY 6XXX
Apiculture I
Summer 2020
3 credits

*This course is co-taught with ENY 4573 Beekeeping I.

Lead-Instructor: Cameron Jack, MSc
Office Room #: ENY (Bldg 964), room 114
Office Address: Steinmetz Hall, Natural Area Drive, P.O. Box 110620, Gainesville, FL 32611
Office Phone #: 352-294-6926 (*Please email to set up a phone appointment.*)
E-mail: cjack@ufl.edu

Instructor: Jamie Ellis, PhD
Office Room #: ENY (Bldg 964), room 116
Office Address: Steinmetz Hall, Natural Area Drive, P.O. Box 110620, Gainesville, FL 32611
Office Phone #: 352-273-3924 (*Please email to set up a phone appointment.*)
E-mail: jdellis@ufl.edu
Website: www.ufhoneybee.com

TA: TBA
Office Room #:
Office Address:
E-mail:

Special Note on Contact via Email: Due to UF privacy laws, you must use your GatorLink account or the Canvas mail system when emailing the Instructor or TA. Emails sent from other accounts (gmail, hotmail, etc.) will not be answered by the Instructor or TA.

Office Hours: By appointment.

Course Description: The biology of honey bees and the craft of apiculture will be examined by exploring the life cycle of honey bees, biogeography and evolution of beekeeping. Equipment, techniques, management practices, pollination ecology, economic practices and current issues within beekeeping will be discussed.

Course Learning Objectives:

1. Identify the different members of a honey bee colony and discuss their different roles within the honey bee nest.
2. Summarize the innovations through history that have shaped our modern beekeeping practices.
3. Recognize the essential pieces of equipment in beekeeping and explain their uses.
4. Discuss the basic management practices used throughout the year and relate how these practices achieve the goals of the beekeeper.
5. Compare honey bees to other pollinators and summarize their economic importance.
6. Identify the valuable and dangerous honey plants of Florida.

7. Discuss the impacts of common stressors to honey bee colonies and describe how to manage them.
8. Communicate the importance of bees or beekeeping best management practices to a non-technical audience.

Required Readings:

1. Textbook: Caron, D.W. 2013 (revised from 1999). Honey Bee Biology and Beekeeping. Wicwas Press. Cheshire, CT, 368 pp.
2. American Bee Journal articles written by Dr. Jamie Ellis which are appropriate for the content of this course.
3. Kaspar, R., C. Cook, and M. D. Breed. 2018 Experienced individuals influence the thermoregulatory fanning behaviour in honey bee colonies. *Animal Behaviour* 142: 69-76.
4. Evens, E., M. Smart, D. Carivaeu and M. Spivak. 2019. Wild, native bees and managed honey bees benefit from similar agricultural land uses. *Agriculture, Ecosystems and Environment* 268: 162-170.
5. Melicher, D. et al. 2019. Long-Distance Transportation Causes Temperature Stress in the Honey Bee, *Apis mellifera* (Hymenoptera: Apidae). *Environmental Entomology* 48: 691–701.
6. Hendriksma, H. P., A. L. Toth, and S. Shafir. 2019. Individual and Colony Level Foraging Decisions of Bumble Bees and Honey Bees in Relation to Balancing of Nutrient Needs. *Frontiers in Ecology and Evolution* 7: 177.
7. Steinhauer, N. et al. 2018. Drivers of Colony Loss. *Current Opinion in Insect Science* 26: 142-148.

Lectures: This is a fully 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 will include videos and supplemental readings. We will provide text from all the narrated presentations, but you should pay close attention, as knowing and understanding the spoken information is critical for success in this course. All lectures and tests will be delivered online in Canvas.

Please note that all video clips and photographs are copyrighted and are NOT to be used outside of this class and may be used only this semester. Please do not copy or distribute these photographs or video clips. All class notes are provided for educational use only.

Course Notifications and Communication: All course communications (assignments, announcements, test information, etc.) will be made via the Announcements in Canvas. Please ensure that your Canvas profile is set to receive notifications (i.e. please check the appropriate box to receive all notifications). To do this, click on your name in the upper right corner of the Canvas homepage after logging into Canvas. Next, click “notifications” on the left. This will take you to the Notification Preferences page. Then, click the check symbol for at least the following notifications: Due Date, Course Content, Announcement, and Grading.

Course Schedule: This course is offered via Canvas as a distance education course. To stay on track, students must adhere to the course schedule.

Module	Video Content	Required Readings	Module Assessments	Critical Thinking Exercises	Beekeeping Experience Report	Extension Project
Getting Started	Syllabus, course orientation, tips for success	Course syllabus; Tips for success	Syllabus quiz May 15 th			
Bees and Beekeeping	Why keep honey bees?	Textbook: p. 9-15; 22-25. ABJ: Members of a colony; Honey bee stings.	Bees and Beekeeping quiz May 22 nd			Project Topic May 22 nd
	Educational resources for beekeepers					
	Naming the bee					
	What to do about honey bee stings?					
	Differentiating bees and wasps					
	Common bee groups					
Honey Bee Biology	Adult members of a honey bee colony	Textbook: p. 49-57; 61-73. ABJ: Honey bee biology; Worker tasks; Swarms. Kaspar et al. 2018	Honey Bee Biology quiz May 29 th	Critical Thinking Exercise 1 May 29 th	RSVP for Beekeeping Field Day Activity May 29 th	
	Immature members of honey bee colony					
	Components of a honey bee nest					
	Life Cycle of a honey bee colony					
	Tasks of honey bee workers					
	Honey bee dance language					
	Honey bee thermoregulation					
Evolution of beekeeping	Ancient honey bee/human interactions	Textbook: p. 13-19. ABJ: Langstroth Hive; Time commitment of beekeeping.	Evolution of Beekeeping quiz June 5 th		Beekeeping Field Day Activity June 6 th	
	The evolution of beekeeping					
	The golden age of beekeeping					
	Beekeeping today					
	Making money with beekeeping					
Beekeeping equipment	The parts of a Langstroth hive	Textbook: p. 159-165. ABJ: Hive tool and smoker; Protective equipment.	Equipment quiz June 12 th			
	Frames and foundation					
	Three essential beekeeping tools					
	Other beekeeping equipment					
	Alternative hive types and sizes					
	Assembling hive equipment					
Getting Started with Beekeeping	Hive choice and configuration	Textbook: p. 177-195. ABJ: Choosing an apiary site; Beekeeping goals. Evans et al. 2019	Getting Started in Beekeeping quiz June 19 th	Critical Thinking Exercise 2 June 19 th		Project 1 st Submission June 19 th
	Starting a new honey bee colony					
	Monetary and time requirements of beekeeping					
	Rules and regulations for keeping honey bees					
	Your bees and other people					
	Qualities of a good apiary location					

Beekeeping Basics	Characteristics of a healthy colony	Textbook: p. 115-126; 232-235. ABJ: Inspecting new colonies; Installing packages and nucs. Melicher et al. 2019	Beekeeping Basics quiz July 3 rd	Critical Thinking Exercise 3 July 3 rd		Peer Evaluations July 3 rd
	How to light a smoker					
	Proper colony inspection techniques					
	Installing packages and nucs					
	Marking and clipping queens					
	Requeening					
	Basic swarm management techniques					
	Making splits					
	Feeding bees					
	Moving bees					
Pollination	Flower anatomy, pollen, and nectar	Textbook: 289-305. ABJ: Making money with bees.	Pollination quiz July 10 th		Beekeeping Report Due July 10 th	
	Pollination Ecology					
	Who are the pollinators?					
	Bees as super pollinators					
	Pollination with honey bees					
Production and Selling of Honey	How bees make honey	Textbook: 237-252. ABJ: Honey extraction and bottling equipment. Hendriksma et al. 2019	Honey Production and Selling quiz July 24 th	Critical Thinking Exercise 4 July 24 th	Peer Reviews of Beekeeping Report July 17 th	
	Optimum Foraging Theory					
	Managing for honey production					
	Monofloral honey					
	Wildflower honey					
	Bad/good honey plants					
	Harvesting honey					
	Honey house rules					
	Honey processing/handling equipment					
	Extracting honey					
	Bottling honey					
	Other honey products					
Labeling and selling honey						
Colony Stressors and Yearly Management	Major arthropod pests of honey bee colonies	Textbook: 205-221; 223-230. ABJ: Biotic stressors; Other stressors. Steinhauer et al. 2018	Colony Stressors and Yearly Management quiz July 31 st	Critical Thinking Exercise 5 July 31 st		Final Submission July 31 st
	Minor arthropod & other pests of honey bee colonies					
	Pathogen stressors of honey bee colonies					
	Other stressors of honey bee colonies					
	Principle stressors of honey bee colonies					
	Spring and summer management					
	Fall and winter management					

Evaluation: The course grade is based on total points earned out of 600 possible points.

Module assessments	25 points each × 10 assessments	250 points
Section critical thinking exercises	45 points each × 5 exercises	225 points
Beekeeping experience RSVP	5 points	5 points
Submission of your peer evaluations of two of your peers' beekeeping reports	10 points × 2 peer reviews (you get 10 points per peer review you submit)	20 points
Peer evaluation of your beekeeping report (two of your peers' evaluations of your report)	25 points × 2 peer reviews	50 points
Extension project	100 points	100 points
	Total Course Points	650 points

Grades and Grade Points

For information on current UF policies for assigning grade points, see catalog.ufl.edu/UGRD/academic-regulations/grades-gradingpolicies/.

FINAL GRADING		
% grade	Letter grade	Points needed to achieve letter grade
100-93	A	≥ 605
90-92	A-	585 – 604
87-89	B+	566 – 584
83-86	B	540 – 565
80-82	B-	520 – 539
77-79	C+	501 – 519
73-76	C	475 – 500
70-72	C-	455 – 474
67-69	D+	436 – 454
63-66	D	410 – 435
60-62	D-	390 – 409
0-59	E	0 – 389

Assignments:

(1) Module Assessments: There is a 25-point assessment associated with each of the ten modules in this course. These assessments are *open note* (i.e. you are allowed to use class lectures, books, websites, etc. while taking the assessments). The assessments will be composed of true/false and multiple choice questions. **The assessments 1) open the Saturday morning after the previous section ends, 2) are timed (60 minutes each), and 3) are due at 11:59 pm on the date listed in the course schedule.** These are individual assessments so please do your own work and do not work in groups or share your answers. There is a large bank of test questions for each assessment and the assessment questions are selected randomly for each student. You will receive a 5-point deduction for each day a module assessment is late.

The first module assessment is a graded syllabus quiz on the “Getting Started” module. You need to read the syllabus and answer quiz questions related to it by **11:59 pm ET on the date listed in the course schedule**. You must complete the syllabus quiz before you are able to advance to the next module. This quiz will show you how your online assessments will be formatted as well as allow you to demonstrate that you understand how this course works and important due dates.

(2) Critical Thinking Exercises: The 10 modules are arranged into five sections. There is a critical thinking exercise associated with each section. The exercises are designed to encourage you to think critically about the content presented in the module lectures. The critical thinking exercises are worth 45 points each. There are separate exercises designed for graduate students incorporating additional questions from the scientific journal articles assigned to that section. These are individual exercises so please do your own work and do not work in groups or share your answers. All of the critical thinking exercises are open note and untimed. You can close and reopen the exercise as many times as you would like until the due date (see course schedule), but you will not be able to make any changes once you have officially submitted your final exercise. **The exercises will be available only during the section open period (see course schedule), are due at 11:59 pm on the date listed in the course schedule.** You will receive a 5 deduction for each day a module assessment is late.

(3) Beekeeping Report: One of the most useful skills in any profession is writing. As such, you are expected to produce a 4-5 page (maximum) written report (12 point, Times New Roman font, double spaced) by participating in one of three activities (attend the Beekeeping Field Day, attend three Honey Bee Club meetings or shadow a beekeeper). Regardless of which activity you choose, you must RSVP and take a sting quiz by the date listed on the course schedule. Students electing to shadow a beekeeper must include the beekeeper’s name and phone number when registering for this option.

Your three options:

1) You can attend the Beekeeping Field Day hosted at the University of Florida Honey Bee Research Building (just east of Charles Steinmetz Hall) in Gainesville, FL. On one Saturday during the semester (see the course schedule for the date), we host a field day during which students construct beekeeping equipment, work live honey bee colonies, extract honey, etc. The field day begins at 9:00 am and concludes around 12:30 pm. Participants must wear socks and close-toed shoes. Long sleeve shirts and pants are encouraged. Please do not wear any dark colored clothes (black, navy, etc.). Following the Field Day, students must write a 4-5 page report on their experience with honey bees and beekeeping during the event. A map and driving direction to the UF Bee Biology Unit are available on the Canvas Course site. No family, friends, spouses, etc. are allowed to attend the field day.

2) You can choose to attend three Honey Bee Club meetings during the semester. The UF Honey Bee Club is a student-led organization which practices and discusses apiculture. Meetings are generally held every other Thursday evening at 5:00 pm at the Honey Bee Research Building (Bldg 960). If you elect to fulfill your beekeeping experience requirement in this manner, you must attend **at least three meetings**. If you only attend two meetings, it will not count towards your required beekeeping experience and you will need to fulfill your requirement by attending

the Field Day or shadowing a beekeeper. It is critical that you sign your name on the attendance sheet as soon as you arrive at the meetings and participate fully. If you decide to go this route, you should start attending meetings as soon as possible to ensure you meet the requirement before the due date of the Beekeeping Report. After attending three meetings, students must write a 4-5 page report on their experiences with honey bees and beekeeping during the meetings.

3) 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 must overcome in his/her operation, etc. Your visit with the beekeeper should be photo-documented (you can/should include photos as figures in the report, though they must be in addition to the 4-5 pages of text). You will receive a score of 0 on the beekeeping report/peer evaluation if you do not shadow the beekeeper in person. This option is mainly intended for students who are unable to attend the field day or attend Honey Bee Club meetings because (1) they live too far from Gainesville or (2) they have a previously-scheduled, legitimate engagements elsewhere during those times. Finding a beekeeper to shadow can take time. Please make every effort to contact a beekeeper by the Beekeeping Experience RSVP (see course schedule for date) so that you can shadow the beekeeper well before the Beekeeping Report is due. Almost every country, region, state, etc. has a beekeepers' association. The best way to find a beekeeper in your area is do an internet search for "your country/state/region/etc. beekeepers association". For example: "Florida Beekeepers Association," "New Zealand Beekeepers Association," "Jacksonville Beekeepers Association," etc. From the website(s) you find, look for the given association's list of contacts, officers, members, etc. and contact one of them to explain your assignment and request a visit. At the end of the day, you have the same resources available to find beekeepers in your area that the Instructor and TAs have. Thus, the responsibility of finding a beekeeper lies with the student who elects to shadow a beekeeper. That said, please contact the Instructor or TA if you need help finding a local beekeeper in your area after exhausting other options.

A grading rubric will be provided to facilitate development and peer review of the beekeeping report. **Five points will be deducted from reports every day past the due date (see the course schedule) that the report is submitted, regardless of the excuse.** Please do not wait until the last minute to produce your 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.

The beekeeping report grade (up to 75 pts) is composed of three components.

- 1) 5 points for the RSVP and sting quiz – You must RSVP for the beekeeping field day and take a sting quiz by the due date noted in the course schedule.
- 2) 20 points for submitting your peer evaluations of two other students' reports (10 points per report) – After submission of all students' beekeeping reports, you will be randomly assigned

two other students' beekeeping reports to peer evaluate using the rubric at the end of this syllabus. You get 10 points per peer review you submit (up to two peer reviews). You will be awarded 0, 10, and 20 points for submitting zero, one or two peer reviews respectively. Your evaluations of two of your peer's reports are due by the date listed in the course schedule.

3) 40 points for your peers' reviews of your beekeeping report – You can receive up to 50 points for the beekeeping report you write and submit. Two students in the class will review your beekeeping report and individually assign a score of 0 – 20 using the beekeeping report rubric at the end of this syllabus. The two scores will be summed to produce the total score for your beekeeping report. Instructors and class TA's will try to detect inconsistencies between peer reviewers, if any.

4) 10 points from the Instructor or TA's reviews of your beekeeping report – The Instructor or TA reviewing the grades assigned to your Beekeeping Report will also read your report to ensure that your peer reviewers graded the report fairly and correctly.

(4) Extension Project: Students enrolled in ENY 6XXX are required to produce an additional extension project which may be in the form of one of three activities (Featured Creatures article (<http://entnemdept.ufl.edu/creatures/>), EDIS document (<http://edis.ifas.ufl.edu/>) or an instructional video). Regardless of which type of extension project you choose, it should have the potential for publication through the University of Florida's extension branch (Cooperative Extension Service). You **must** check with the TA before beginning your project so that they can verify that such a document or instructional video does not already exist on your topic. The instructor or TA can provide ideas for selecting a topic. **A grading rubric will be provided to facilitate development of the extension project.**

Your three options:

1) If you select to write a Featured Creatures document, you must choose a bee pollinator or bee pest of interest and write about it following the standard Featured Creature format. This format is available at the Featured Creatures link above under the "Format for Authors" link. Here are two examples of published Featured Creatures articles completed by students in this course http://entnemdept.ufl.edu/creatures/MISC/BEES/Apis_dorsata.htm
http://entnemdept.ufl.edu/creatures/misc/bees/Nomada_fervida.htm.

2) EDIS documents can be written on a special topic regarding honey bees or beekeeping. These documents are designed to be informational or instructional how-to documents for the public. Students should refer to the "Publishing FAQs" under "Instructions for Authors" on the EDIS website for publication guidelines. Here are two examples of published EDIS documents completed by students in this course <https://edis.ifas.ufl.edu/in1123>
<https://edis.ifas.ufl.edu/in1064>.

All written reports should convey scientific information in a way that a high school student could understand. Figures are extremely helpful in extension documents, and students are encouraged to include as many figures as necessary to explain a topic. You must obtain use permission from the owner of any figures you include in your final report if the figure is not original to you. There

will be an additional assignment to submit with the Final Extension Report called “Extension Report Figures and Permissions.” For this assignment, you will upload the full-sized jpeg file for each figure and fill in the accompanying word document with the proof of permission for use.

3) If you enjoy using a camera and are skilled in videography, you may wish to produce a 5-minute instructional or informational video useful to U.S. beekeepers. You will still write a draft and a production plan for others to peer review that will be graded using a different rubric. If you do not have the technical expertise to perform the beekeeping tasks in the video, the Instructors or course TA’s may be available to help. The video should be of excellent quality; thus, you will need to have access to professional equipment and should have previous experience filming in a narrative style. The video of course does not have to be a masterpiece, but it should be professional enough that it can be published on our lab YouTube channel. Here are two examples of videos produced by a student in this class <https://youtu.be/urDsKwHPAV0>
<https://youtu.be/U6HyBbs9454>.

There are four components of the extension project that compose the completed assignment. Due dates for each component are listed in the course schedule.

- 1) Report Topic Due – The student should identify and record the topic chosen for the extension report by completing the Canvas assignment “Extension Report Topic.”
- 2) 1st Submission – This is not a rough draft, but rather is what the student considers the completed document. If you are producing a video, you will need to submit a detailed production plan.
- 3) Peer Review – The 1st submission will be shared with other graduate students in the class who will provide a peer review of the report by the due date listed in the course schedule. Each student will peer review two extension reports.
- 4) Final Submission – Students are expected to revise the extension report or production plan per the comments provided during the peer review process. The final report or video must be submitted by the due date shown in the course schedule.

A grading rubric will be provided in Canvas to facilitate development and peer review of the extension project. **Five points will be deducted from the final project score every day past the due dates that any of the information requested above is late, regardless of the excuse.** Please do not wait until the last minute to submit your project or meet any of the other deadlines. All points lost will be deducted from the final Extension Project grade.

Absences and Make-Up Work: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Online Course Evaluation Process: 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 gatorevals.aa.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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

Academic Honesty: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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.” The Honor Code (sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Services for Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, dso.ufl.edu/drc) 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.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact <mailto:umatter@ufl.edu>, 352-392-1575, or visit 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 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 shcc.ufl.edu.

University Police Department: Visit 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; ufhealth.org/emergency-room-trauma-center.

Academic Resources

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services career.ufl.edu/.

Library Support: cms.uflib.ufl.edu/ask various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring. teachingcenter.ufl.edu/

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. writing.ufl.edu/writing-studio/

Student Complaints On-Campus: sccr.dso.ufl.edu/policies/student-honor-codestudent-conduct-code/

On-Line Students Complaints: distance.ufl.edu/student-complaint-process/