Social Insects (Graduate)
ENY 6934

Fall 2020 (3 credits)

Course Overview

Social insects are among the most successful organisms on the planet... and also some of the most fascinating! In this course, we will examine in depth the astounding diversity of social behaviors exhibited by insects, ranging from transient parental care to the complex supersocieties of ants, bees, and termites. We will also explore the evolutionary causes and consequences of insect sociality, current trends in social insect research, and other special topics. Laboratory demos and activities will allow students to gain hands-on experience observing and working with social insects. Through this course, students will gain a firm foundation in the identification, evolution, and behavior of the major social insect groups, and will be well-prepared for additional coursework in entomology, sociobiology, and animal behavior.

Course Catalog description: Introduces social wasps, bees, ants, & termites: their natural history; social behavior; division of labor, caste differentiation, evolution, identification, & rearing. Laboratory involves live insects.

Student Learning Outcomes

By the end of the course, students will be able to:

• Identify the major orders and families of social arthropods, with an emphasis on social insects.

• Compare and contrast the diverse social behaviors exhibited by different insect groups, as well as the organization of different insect societies.

• Explain how and why social behavior evolved in these different insect lineages, including the genetic and physiological mechanisms underlying social behaviors, the selective pressures driving the evolution of sociality, and the benefits & costs of sociality in insects.

• Interpret and evaluate primary scientific literature in the field of insect sociobiology, and effectively communicate those findings to their peers.

In working towards these goals, students will hopefully also foster a sense of curiosity and appreciation for social insects and their many fascinating, complex behaviors.
Readings & Course Materials

**Required Readings & Videos:** There is no textbook for this course. Readings will consist of articles and book chapters that will be posted on the Canvas website before each class session. Students may be required to view brief videos and/or other media before class as well; links to these materials will also be posted on Canvas.

**Other Required Materials:** This is an online course. All students must have regular access to a computer with a reliable internet connection and the Zoom application (https://ufl.zoom.us).

Course Communication

**Meeting Policy:** We are happy to discuss any aspect of this course with you! Outside of office hours, email is the preferred method of contact for all instructors. We will attempt to respond within 24 hours to emails received Monday-Friday, or by the following workday to emails sent during weekends/holidays. As a courtesy, please check this syllabus and Canvas for answers to your questions before reaching out.

**Canvas:** Important announcements and updates will be regularly posted to the course Canvas website, so be sure to check Canvas frequently! To ensure that you do not miss anything, please ensure that your Canvas profile is set to receive notifications.

**Email Accounts:** UF policies require you to use your GatorLink account or the Canvas mail system when emailing your instructors; we will not answer emails sent from other accounts (e.g., Gmail).

**Professional Conduct:** All participants in this class are expected to conduct themselves in a *professional and respectful manner* at all times. As such, please use appropriate etiquette when interacting with your peers and instructors, including during class, on Canvas, and via email.

Attendance & Participation

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/UGRD/academic-regulations/attendance-policies/.

Instructors’ Note: The learning experience is greatest when everyone in the class is present and contributes. If you are absent, you will not be able to share your insights during class or benefit from the insights your peers and instructors. Thus, all students are expected to **attend every class session on time** and **stay for the entire session**. Students are also expected to be **fully prepared for and engaged** in each class session—this includes doing all of the assigned readings, submitting all assignments by their deadlines, and actively participating in class activities.

If you need to miss a class due to an **excusable absence**, you must let the instructor know as far in advance as possible to discuss arrangements for making up any missed work. The instructor may request documentation. If you are absent for any other reason or fail to notify the instructor of an excusable absence in a timely manner, you may not be able to make up in-class work.

If you miss a session, please contact a classmate for notes— the instructors will not provide notes.
Exams & Assignments

Quizzes: There will be 11 online quizzes throughout the semester (see the Course Schedule for dates), which must be submitted in Canvas before the start of class (9:35am) on the due date. These quizzes will be based on the required pre-class readings and videos, and are designed to help ensure that you are prepared for our discussions and other in-class activities. At the end of the semester, your lowest quiz grade will automatically be dropped.

Exams: There will be two exams in this course (a midterm and a final exam), which are designed to assess your understanding of the course content. Each exam will be available for one week on Canvas, and must be submitted via Canvas by the due date indicated in this syllabus. The graduate student version of each exam will differ from the undergraduate versions.

Reflections: Throughout the semester, you will be asked to submit brief written reflections of our class sessions via Canvas. The goal of these assignments is to help you think deeply about the content, including the ideas shared during our class discussions. There will be 11 reflections total; at the end of the semester, your lowest reflection grade will automatically be dropped.

“Hot Topic” Presentations: Each student will be required to give a 10-minute presentation to the rest of the class on a “hot topic” in the field of social insect biology. This assignment will allow you to explore a topic of special interest in more detail, and also help you practice critical reading and communication skills. Detailed guidelines for this project will be discussed later in the semester.

Graduate Project: Throughout the semester, each graduate student will complete an individual project, in the form of either (1) a research review paper or (2) an extension paper. This assignment will allow you to explore an additional topic of interest in depth, ideally one that is relevant to your own graduate research. It will also allow you to practice reading, evaluating, and synthesizing primary scientific literature. Detailed guidelines for this project will be discussed later in the semester.

Extra Credit: Extra credit assignments may be posted at the instructor’s discretion. Any other extra work submitted in order to raise a grade will not be accepted.

Submitting assignments: All assignments must be submitted electronically through Canvas unless otherwise noted. You are responsible for ensuring that all of your work is uploaded correctly and completely by the deadline. Documents that are incomplete, corrupted, or blank will be treated as late work (with associated penalties) until they are re-uploaded correctly, so please always double check your files!

Policy on Late Work

All assignments must be submitted by the due date and time indicated in this syllabus/on Canvas. If an assignment is submitted after that time, 20% of its total point value will be deducted for every day that it is late. You will not receive credit for late work if it is submitted more than 5 days late or after the instructors have graded and returned the assignment to the class.

If you miss a class session, you are still responsible for turning in the work due on that date at the required time. Penalty-free extensions on assignments will be considered on a case-by-case basis only in the event of an unforeseen excusable absence or other emergency. In such a case, you must contact the instructors as soon as you are able to discuss these arrangements.
Grading

This course uses a percent scale for grading. Each assignment category is worth a certain percentage of your total course grade, distributed as follows:

Quizzes: **15%**  
Midterm Exam: **18%**  
Final Exam: **18%**  
Reflection Assignments: **15%**  
“Hot Topics” Presentation: **15%**  
Graduate Project: **19%**

At the end of the semester, your total course grade will be converted to the corresponding letter grade as shown below:

- 90 - 100% = A  
- 87 - 89.9% = B+  
- 80 - 86.9% = B  
- 77 - 79.9% = C+  
- 70 - 76.9% = C  
- 67 - 69.9% = D+  
- 60 - 66.9% = D  
- below 60% = E

Please note that the instructor does not round up grades—requests to do so will not be honored.

For current UF policies on assigning grade points, consult the following policy website: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Disputing a grade: If you wish to dispute a grade for any exam/assignment, you must contact the instructors in writing within two days (48 hours) after the assignment has been returned. In your message, you must include a specific explanation for why you think the grade is incorrect and how you think it should be changed. An instructor will then arrange a meeting with you to discuss the issue and determine whether or not to change the grade. The grade assigned following this meeting will be final.

Course Schedule

Below is a tentative schedule of topics and assignments for the semester. Readings/videos for each session will be posted on Canvas. Unless otherwise noted, all readings must be completed and all assignments submitted before the start of class (i.e., 9:35am) on the indicated due date.

Note: Due dates for the “Hot Topics” presentations will be discussed in class and posted on Canvas during the semester.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 31st (M)</td>
<td>Introduction to the Course &amp; Sociality</td>
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<td></td>
<td>Sept. 2nd (W)</td>
<td>Overview of Social Insect Diversity</td>
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<tr>
<td>Date</td>
<td>Day</td>
<td>Topic</td>
<td>Activity</td>
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<tr>
<td>Sept. 7th</td>
<td>M</td>
<td>Labor Day Holiday– NO CLASS!</td>
<td></td>
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<tr>
<td>Sept. 9th</td>
<td>W</td>
<td>Review of Evolutionary Biology &amp; Phylogenetic Trees</td>
<td>Quiz #1</td>
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<tr>
<td>Sept. 14th</td>
<td>M</td>
<td>Categories of Sociality</td>
<td>Quiz #2</td>
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<tr>
<td>Sept. 16th</td>
<td>W</td>
<td>Parental Care in Arthropods</td>
<td>Reflection #1</td>
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<tr>
<td>Sept 21st</td>
<td>M</td>
<td>Non-Eusocial Insect Societies</td>
<td>Quiz #3</td>
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<tr>
<td>Sept. 23rd</td>
<td>W</td>
<td>Introduction to Eusocial Insects</td>
<td>Reflection #2</td>
</tr>
<tr>
<td>Sept. 28th</td>
<td>M</td>
<td>Origins of Eusociality: Ants, Bees, &amp; Wasps</td>
<td>Quiz #4</td>
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<tr>
<td>Sept. 30th</td>
<td>W</td>
<td>Origins of Eusociality: Termites</td>
<td>Grad. Project Topic</td>
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<tr>
<td>Oct. 5th</td>
<td>M</td>
<td>Convergence &amp; Differences in Eusocial Systems</td>
<td>Quiz #5</td>
</tr>
<tr>
<td>Oct. 7th</td>
<td>W</td>
<td>Additional Topics in Eusociality</td>
<td>Reflection #4</td>
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<tr>
<td>Oct. 12th</td>
<td>M</td>
<td>Review for Midterm</td>
<td>Midterm posted (at 5:00pm)</td>
</tr>
<tr>
<td>Oct. 14th</td>
<td>W</td>
<td>Special Topics (TBD)</td>
<td></td>
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<tr>
<td>Oct. 19th</td>
<td>M</td>
<td>Observational Activity: Interactions within a Colony</td>
<td>Midterm due (by 5:00pm)</td>
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<tr>
<td>Oct. 21st</td>
<td>W</td>
<td>Kin &amp; Nestmate Recognition</td>
<td></td>
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<tr>
<td>Oct. 26th</td>
<td>M</td>
<td>Mechanisms of Sociality &amp; Caste Determination</td>
<td>Quiz #6</td>
</tr>
<tr>
<td>Oct. 28th</td>
<td>W</td>
<td>Division of Labor &amp; Polyethism</td>
<td>Grad. Project Outline</td>
</tr>
<tr>
<td>Nov. 2nd</td>
<td>M</td>
<td>Social Structures &amp; Policing</td>
<td>Quiz #7</td>
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<tr>
<td>Nov. 4th</td>
<td>W</td>
<td>Communication within Social Groups</td>
<td>Reflection #6</td>
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<tr>
<td>Nov. 9th</td>
<td>M</td>
<td>Ecological Functions &amp; Impacts of Social Insects</td>
<td>Quiz #8</td>
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<tr>
<td>Nov. 11th</td>
<td>W</td>
<td>Veterans’ Day Holiday– NO CLASS!</td>
<td></td>
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<tr>
<td>Nov. 16th</td>
<td>M</td>
<td>Social Insects as Invaders &amp; Pests</td>
<td>Quiz #9</td>
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<tr>
<td>Nov. 18th</td>
<td>W</td>
<td>Symbioses in Social Systems</td>
<td>Reflection #7</td>
</tr>
<tr>
<td>Nov. 23rd</td>
<td>M</td>
<td>Social Parasitism</td>
<td>Quiz #10</td>
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<tr>
<td>Nov. 26th</td>
<td>W</td>
<td>Thanksgiving Holiday– NO CLASS!</td>
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<tr>
<td>Nov. 30th</td>
<td>M</td>
<td>Pathogens &amp; Social Immunity</td>
<td>Quiz #11</td>
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<tr>
<td>Dec. 2nd</td>
<td>W</td>
<td>Beyond Insects: Social Spiders</td>
<td>Reflection #8</td>
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<tr>
<td>Dec. 7th</td>
<td>M</td>
<td>Comparing Insect &amp; Human Societies</td>
<td>Grad. Project Final Draft</td>
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<tr>
<td>Dec. 9th</td>
<td>W</td>
<td>Human Applications of Insect Sociality; Course Wrap-Up</td>
<td>Reflection #9</td>
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<tr>
<td>Finals</td>
<td>Date</td>
<td>Scheduled Final Exam date</td>
<td>Final Exam (by 2:30pm)</td>
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* Although we will do our best to adhere to this schedule, it may be adjusted during the semester to accommodate opportunities, disruptions, etc. These changes will be communicated clearly via Canvas.
List of Important Dates

Key dates to remember are below—be sure to add them to your calendar!

September 7th: No class (Labor Day)
October 19th: Midterm Exam due
November 11th: No class (Veterans’ Day)
November 26th: No class (Thanksgiving Holiday)
December 2nd: Final Draft of Graduate Project due
December 17th: Final Exam due

Due dates for other assignments are listed in the Course Schedule and on Canvas.

University Policy on 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.

Accommodations 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.

Disability Resource Center
001 Reid Hall
(352) 392-8565
https://disability.ufl.edu/
Instructors’ Note: Remember, we want to help you succeed in this course! After we receive your request and documentation, we will arrange a meeting with you to discuss the accommodation options in more detail. To ensure that the necessary accommodations are in place as early as possible, please be sure to start this process at (or before) the beginning of the semester!

Ensuring Privacy in Online Courses

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the “chat” feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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.

Course Evaluations

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: https://gatorevals.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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at: https://gatorevals.aa.ufl.edu/public-results/.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing 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
Counseling Services, Groups and Workshops, Outreach and Consultation, Self-Help Library, Wellness Coaching

3190 Radio Road
(352) 392-1575; https://counseling.ufl.edu

Other campus resources include:

• **U Matter, We Care:** http://umatter.ufl.edu

• **Career Connections Center:** Reitz Student Union- First Floor; (352) 392-1601; http://career.ufl.edu

• **Student Success Initiative:** http://studentsuccess.ufl.edu

• **Student Complaints:** Complaints regarding on-campus courses may be filed at https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/. For online courses, please see https://distance.ufl.edu/getting-help/student-complaint-process/.

**It is your responsibility to make sure that you fully understand and comply with the policies outlined in this syllabus, as well as the policies of the university as they relate to this course. If you have any questions, please contact the instructors!**

Cover Photo: *Allomerus octoarticulatus* workers with brood, by Alex Wild