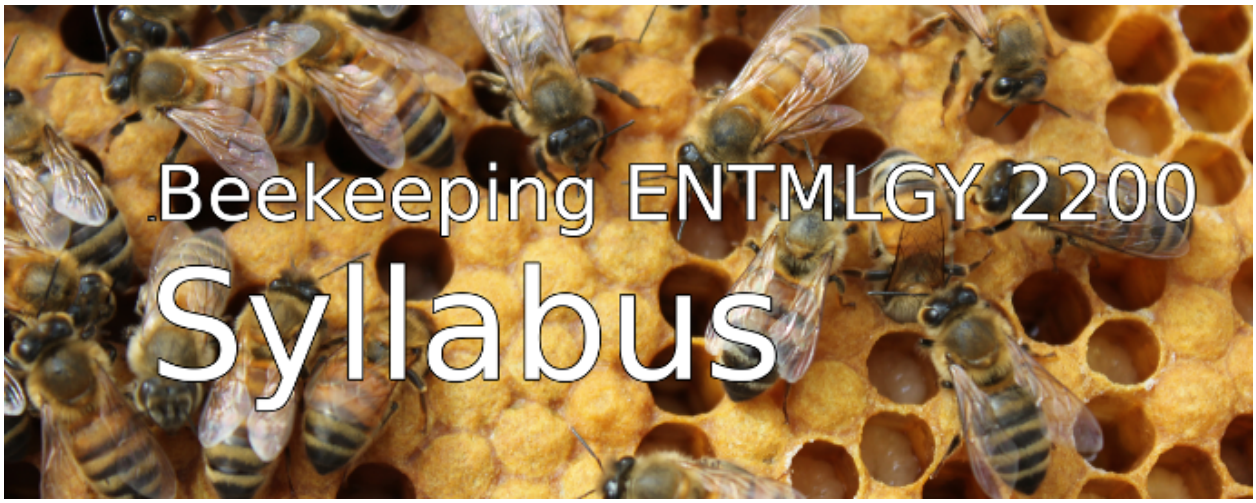

Spring 2023

Course Information

- **Course times and location:**

  Lectures and Quizzes: Recorded and available in Carmen to be completed at any time during the week assigned (asynchronous, online)

  On-campus labs (required, in-person):

  Columbus Campus:

  Lab Section 1: Wednesdays 1:50 - 3:40 PM

  Lab Section 2: Wednesdays 3:55 - 5:45 PM

  In 334 Kottman Hall in January through March; at the Rothenbuhler Honey Bee Laboratory in April.

  Wooster Campus:

  Tuesdays 4:10-6 PM at the Honey Bee Laboratory (next to the SAC)

- **Credit hours:** 3
- **Mode of delivery:** Hybrid (67% Online, 33% On Campus)

Instructor

- **Name:** Reed Johnson, Associate Professor of Entomology
- **Email:** johnson.5005@osu.edu
- **Phone Number:** 330-202-3523 (Office)
- **Office location:** 255 Kottman Hall (Columbus)

- **Office hours:** In-person in 255 Kottman Hall on Wednesdays 1:00 – 1:50PM

Zoom on Mondays and Fridays 3:00 – 4:00PM
https://osu.zoom.us/j/93136074496?pwd=MHlZdW1PbkNkekNJYSt2dzR6YkxaQT09
Passcode: 655483

- **Preferred means of communication:**
  - My preferred method of communication for questions is **email.**
  - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Teaching Assistants

- **Name:** Adam Foster (Columbus)
- **Email:** foster.423@osu.edu
- **Name:** Brandon Shannon (Wooster)
- **Email:** shannon.325@osu.edu

Course Prerequisites

None

Course Description

This class presents general information on the biology, behavior and management of honey bee colonies, including pollination and simple honey processing.

Learning Outcomes

By the end of this course, students should successfully be able to:

- Understand the basic biology and behavior of the common honey bee (*Apis mellifera* L.).
- Use all the traditional hive equipment and protective equipment necessary to successfully open a bee colony.
- Understand the contributions that honey bees make to human society.
- Discuss popular media topics of the day such as pesticide effects on bees, Africanized honey bees (Killer Bees), Colony Collapse Disorder (CCD), parasitic mite predation (*Varroa* mites), urban beekeeping and honey laundering.
- Be knowledgeable in routes to a successful bee-based business through gathering and processing surplus honey crops, pollination services or production of bees and queens.

How This Course Works

Mode of delivery: This is a hybrid course. Lectures are pre-recorded and will be available in an asynchronous format any time during the week they are assigned. Discussions, quizzes and exams will be administered through Carmen. We have on-campus labs each week on Wednesdays at either 1:50 - 3:40PM (Lab Section 1) or 3:55 - 5:45 PM (Lab Section 2). Labs will meet in 334 Kottman Hall (https://goo.gl/maps/9yJG2fsGgEhSekbz9) through the end of March and at the Rothenbuhler Honey Bee Laboratory https://goo.gl/maps/n7avsn3unuFmNvgu6 in April.

Pace of online activities: This course is divided into **weekly modules** that are released each week at 8AM on Mondays. Most assignments and quizzes are due at 11:59PM on Sundays. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame. Assignments due at an alternate time than 11:59PM on Sunday will be communicated via Carmen assignment due dates and on the course schedule.

Credit hours and work expectations: This is a **3-credit-hour course**. According to Ohio State bylaws on instruction (go.osu.edu/credithours), students should expect 4 hours per week of time spent on direct instruction and laboratory activities (e.g. instructor content, laboratory and Carmen activities), in addition to 5 hours of homework (e.g. reading, assignment preparation and reporting) to receive a grade of (C) average.

Attendance and participation requirements: Research shows regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Participating in online activities for attendance**: **at least once per week**
  You are expected to log in to the course in Carmen every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible.*
- **Participating in on-campus laboratory meetings**: **once per week**
  You are expected to attend all laboratory sections for the entire scheduled period. Exceptions will be made for excused absences (medical or school-function absences with a note) and make-up exercises will be provided, when possible. Three unexcused absences from the laboratory period will result in a failing grade. Students may request to attend a different lab section if space allows.
- **Zoom meetings and office hours**: **optional**
  All live, scheduled events for the course, including my office hours, are optional. I will post recordings of synchronous sessions for those who cannot attend.
- **Participating in discussion forums**: **as assigned, there will not be a discussion every week**
  As part of your participation, each week you can expect to post as part of our substantive class discussion on the week's topics.

Course Materials, Fees and Technologies

Required Materials and/or Technologies

- Graham, Joe (Ed.) The Hive and the Honey Bee. Hamilton, IL: Dadant and Sons, Inc. 2015. ISBN: 978-0915698165 There may be older editions of this book available, but readings are from the **2015 edition**.
- Delaplane, Keith. First Lessons in Beekeeping. Hamilton, IL: Dadant and Sons, Inc. 2007. ISBN: 978-0915698127
- Nordhaus, Hannah. The Beekeeper's Lament. New York, NY: Harper Perennial. 2011. ISBN: 978-0061873256

All required books are available through the Barnes and Noble OSU Bookstore (https://ohiostate.bncollege.com/).

Recommended/Optional Materials and/or Technologies

- Winston, Mark. The Biology of the Honey Bee. Cambridge, MA: Harvard University Press. 1987. ISBN: 978-0674074095
- Caron, Dewey M and Connor, Lawrence J. Honey Bee Biology and Beekeeping. Kalamazoo, MI: Wicwas Press, LLC. 2013. ISBN: 978-1878075291
- Dadant, C.P. First Lessons in Beekeeping. Dadant and Sons, Inc. 1918. http://openlibrary.org/books/OL24170193M/First_lessons_in_beekeeping
- Frisch, Karl von. Dancing Bees. London: Metheun & Co., Ltd. 1954.
- Sammataro, Diana and Alphonse Avitable. The Beekeeper's Handbook, 4th Edition. Ithaca and London: Comstock Publishing Associates. 2011. ISBN: 978-0801476945

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection.
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access (go.osu.edu/student-tech-access).

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the installing Office 365 (go.osu.edu/office365help) help article for full instructions.

CarmenCanvas Access

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes, good for 365 days, that can each be used once.
- Install the Duo Mobile application (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- Navigating CarmenCanvas (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)
- Recording a slide presentation with audio narration and recording, editing and uploading video (go.osu.edu/video-assignment-guide)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat**: go.osu.edu/it
- **Phone:** 614-688-4357 (HELP)
- **Email:** servicedesk@osu.edu

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Points
Quizzes and Discussion Posts (generally 5 points each)	116
Exams (three, 75 points each)	225
Literature Review Papers (40 points each) and Paper Proposals (5 points each)	90
Video Presentation	30
Beekeeping Journal (13 entries, 3 points each)	39
Total	**500**

See Course Schedule for due dates.

Descriptions of Major Course Assignments

You should expect to complete 2-3 quizzes or discussion posts worth a total of up to 15 points per week.

Quizzes

The format of these assignments will vary, but will include multiple choice quizzes, short essay questions, fill-in-the-blank questions or exercise based assignments administered through Carmen's quizzing system.

Academic integrity and collaboration: Students may work together on quizzes and may use notes and other course resources.

Discussions

For discussion-based assignments students will be graded on the completeness and relevance of their response to the discussion prompt, but also have the opportunity to refer to and respond to posts made by other students in the discussion thread.

Academic integrity and collaboration: Students may work together on discussion posts and may use notes and other course resources.

Exams

The three exams, two regular exams and a final, each worth 75 points, will be administered in Carmen. Dates for exams are listed in the Course Schedule. All exams will consist of multiple choice, short answer and short essay questions. Exams will test your understanding of concepts and skills presented both in lecture and lab. All exams will be cumulative, but with a greater focus on newer material.

Academic integrity and collaboration: Students must complete exams by themselves but may use notes and other course resources.

Literature Review Papers

Two short literature review papers, one written on a topic in **Bee Biology** and one on a **Beekeeping** topic, will be required. The choice of topic is entirely up to you but should be presented with more detail than anything presented in class. See Sample Topics for Literature Review Papers for suggestions, but you are encouraged to explore topics not included on this list.

You will submit a one paragraph "Paper Proposal" (worth 5 points) for both papers. The paper proposal will outline the topic to be covered in the full paper and will include a proposed title and **two references**. Proposals will provide an opportunity for the instructor to provide you with feedback on the topic and scope of the proposed paper. Paper proposals will be due 2 weeks before the final paper is due on dates listed in the Course Schedule.

Papers will be graded using the Rubric for Literature Review Papers at the end of this syllabus. Papers should cite at least **four references**. Papers should be 2-3 pages in length (8 ½" x 11", 1" margins, double-spaced, 12 point Times New Roman or similar font). Figures or images may be included, but the text component of your paper must still be 2-3 pages in length. Reference formatting should follow the APA style or an established citation style in your field of study. Papers will be due on dates listed in the Course Schedule.

Academic integrity and collaboration: Writing is expected to be your own original work and excessive quotation (more than a sentence) or direct copying of previously written text, either by the student or other authors, is not allowed. Figures or images from other sources may be included with appropriate attribution. You are encouraged to ask a trusted person to proofread your paper before turning it in, but no one else should revise or rewrite your work.

Video Presentation

You will make a 5 minute recorded presentation to be posted on Carmen and shared with other students in the course. The topic of this presentation may be related to one of your paper topics or may be on an unrelated topic relevant to beekeeping. Presentations must include pictures, figures or videos and be recorded in a format that can be viewed by all students in the course. Interviews or video demonstrations that get away from a PowerPoint-style presentation are welcome and encouraged. See https://go.osu.edu/video-assignment-guide for help on preparing this presentation. The video presentation will be due on the date

listed in the Course Schedule. Students will be required to post a link to their recorded presentation along with a multiple-choice question that could appear on the final exam in the discussion group for their lab period. Students are expected to view presentations made by other students in their lab section and answer 10 questions relating to student presentations on the final exam.

Academic integrity and collaboration: Students may work together to make their presentations, but each student must submit their own assignment and must narrate and present the material themselves. The text and narration for the presentation, as well as the potential final exam question, should be your original work. However, images or videos can be taken from other sources with appropriate attribution.

Beekeeping Journal

A written and visual record of laboratory activities is required of all students. For many indoor labs students will be given specific questions to answer or illustrations to include in their journal. For labs meeting in the field, and for all labs unless otherwise specified, students should write a summary of the activities performed and their outcome with at least one illustration. Students can choose to make their notebooks in either traditional paper format or through an electronic medium. Due dates for journals are listed in the Course Schedule. If a student chooses to keep a paper notebook, it should be brought to lab on the due dates for grading. Electronic notebooks can be submitted through the Carmen site for the course anytime on or before the due date.

Academic integrity and collaboration: Beekeeping journal entries may be written in collaboration with your lab partners. Illustrations must be original work made by the student or their lab partners and can be either photographs or hand-drawn illustrations.

Late Assignments

Please refer to Carmen for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments. Exams, quizzes, discussions and beekeeping journals will not be accepted after the due date. Papers and the video presentation will be subject to a 10% point deduction per school day for each day late and will not be accepted if over 3 days late. Exceptions will be made for excused absences.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call 614-688-4357 (HELP) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me through a private message in Carmen or through an e-mail to johnson.5005@osu.edu I will reply within **24 hours on days when class is in session at the university**.

- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week. Grades for graded discussions will be posted within **seven days** of the due date for the discussion.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

Grading Scale

93% - 100%	465 - 500 points	A
90% - 92.9%	450 - 464 points	A-
87% - 89.9%	435 - 449 points	B+
83% - 86.9%	415 - 434 points	B
80% - 82.9%	400 - 414 points	B-
77% - 79.9%	385 - 399 points	C+
73% - 76.9%	365 - 384 points	C
70% - 72.9%	350 - 364 points	C-
67% - 69.9%	335 - 349 points	D+
60% - 66.9%	300 - 334 points	D
Less than 60%	Less than 300 points	E

Other Course Policies

Honey Bee Stings

Students must be aware that we will be working with live honey bees in this class and that being stung is a normal and expected part of beekeeping activities. Honey bee stings can be painful but are not life threatening for the great majority of people. Wear loose-fitting long pants, closed-toed shoes and avoid using highly scented personal care products to protect yourself from stings. Students will also be provided with standard protective gear (veiled jacket and gloves), but these will serve only to minimize stinging. **NO AMOUNT OF PREPARATION OR PROTECTIVE EQUIPMENT CAN ELIMINATE THE POSSIBILITY OF BEING STUNG.**

Honey bee stings can be life threatening if someone knowingly or unknowingly has an allergy to bee venom. Students that believe they may have a bee sting allergy must discuss the situation with both a health care provider and the instructor prior to any bee-related activities so that accommodations can be made.

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work**: Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Academic Integrity Policy

See Descriptions of Major Course Assignments for specific guidelines about collaboration and academic integrity in the context of this class.

Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's Code of Student Conduct (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.
If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes

associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member."

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen site for this course; and can also be found at https://go.osu.edu/principlesofcommunity. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (https://equityandinclusion.cfaes.ohio-state.edu/). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at https://studentlife.osu.edu/bias/report-a-bias-incident.aspx.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services (SLDS). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services.

Disability Services Contact Information

- Phone: 614-292-3307
- Website: slds.osu.edu
- Email: slds@osu.edu

- In person: Baker Hall 098, 113 W. 12th Avenue

Accessibility of Course Technology

The online components of this course require use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- CarmenCanvas accessibility (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- CarmenZoom accessibility (go.osu.edu/zoom-accessibility)

Course Schedule

Refer to the CarmenCanvas course for up-to-date due dates.

Lectures will be posted to Carmen by 8AM on the dates listed. Students are expected to watch lectures, do the assigned reading and complete any **quizzes or homework assignments for each week by Sunday nights before 11:59PM**. Due dates for exams, paper proposals, papers and the video presentation are listed in bold and are at 11:59PM on Sundays unless otherwise noted.

Date	Lecture / Major Assignments Due	Reading
1/9	Week 1 Welcome; Bee basics	Delaplane Ch. 2 (11-28) Graham Ch. 22 (673-677) Graham Ch. 6 (168-169)
1/11	Week 1 Colony nutrition and development	Graham Ch. 10 (296-301) Graham Ch. 4 (78-80) Graham Ch. 6 (189-192)
1/16	MARTIN LUTHER KING DAY (No Class)	
1/18	Week 2 Queen Development and Haplodiploidy	Graham Ch. 4 (80-82) Graham Ch. 7 (203-211)
1/23	Week 3 Temporal Polyethism	Graham Ch. 4 (82-87) Graham Ch. 6 (192-195) Havukainen Science Daily (1 p.)
1/25	Week 3 Honey Bee Subspecies and Relatives (including Africanized bees)	Delaplane Ch 1. (1-9) Graham Ch 3. (53-67) Graham Ch 4. (95-103)
1/30	Week 4 Nest Site Selection and Nest Architecture	Graham Ch. 4 (72-78)
2/1	Week 4 Karl von Frisch and the Dance Language	
2/6	Week 5 Sociality and Chemical Communication	Graham Ch. 11 (311-322)
2/8	Week 5 Worker and Brood Chemical Communication	Graham Ch. 11 (322-328)
2/12	**Bee Biology Paper Proposal Due (5 points)**	
2/13 – 2/15	**Exam I (75 points; ends Wednesday 2/15 at noon)**	
2/15	**Beekeeping Journal Due in Lab (15 points)**	
2/15	Week 6 Honeyflow and the Foraging Problem	NASA Hive Scale Project (3 p.)
2/20	Week 7 Bee Botany and Phenology	Nordhaus Ch. 1 Delaplane Ch. 5 (78-84) Graham Ch. 13 (371-375; 421)

2/22	Week 7 Planting for Pollinators and Commercial Pollination	Graham Ch. 13 (457-459) Graham Ch 26 (803-809, 823-829)
2/26	**Bee Biology Paper Due (40 points)**	
2/27	Week 8 Brood Diseases and Pests of Comb	Nordhaus Ch. 3 (pp. 55-82) Delaplane Ch. 8 (105-143)
3/1	Week 8 Varroa and Other Adult Diseases	Graham Ch. 27 (852-856) Nordhaus Ch. 5 and 6 (pp. 115-169) Minnesota "Sugar Shake" Poster
3/6	Week 9 Pesticides	Graham Ch. 28. (881-884, 897-900)
3/8	Week 9 CCD and Beekeeping History	Graham Ch. 1 & 2 (1-22)
3/13 - 3/17	SPRING BREAK No Class	
3/20	Week 10 Beekeeping Innovations; Honey and Wax Processing; Propolis Processing	Graham Ch. 2 (25-50) Delaplane Ch. 6 (85-97)
3/22	Week 10 Crystalization and Honey Laundering	Nordhaus Ch. 9 (pp. 231-253) Food Safety News articles
3/26	**Beekeeping Paper Proposal Due (5 points)**	
3/27 – 3/29	**Week 11 Exam II (75 points; ends Wednesday 3/29 at noon)**	
3/29	**Beekeeping Journal Due in Lab (15 points)**	
3/29	Week 11 Sting Safety and EpiPens; Apiary Law and Location	Graham Ch. 29 (913-919)
4/3	Week 12 Landscape and Urban Beekeeping; Installing Packages	Delaplane Ch. 4 (47-62)
4/5	Week 12 Swarms, Packages, Nucs, Splits and Requeening	Graham Ch. 15 (487-505)
4/9	**Beekeeping Paper Due (40 points)**	
4/10	Week 13 Drone Biology and Drone Congregation Areas	Graham Ch. 4 (87-89) Graham Ch. 10 (304-305)
4/12	Week 13 Queen Breeding and Queen Rearing	Graham Ch. 24 (777-784) Nordhaus Ch. 7 (pp. 172-201)
4/16	**Video Presentation + Possible Exam Question on Presentation Due (30 points)**	
4/17	Week 14 Feeding and Overwintering	Delaplane Ch. 7 (99-103) Graham Ch. 21 (629-633)
4/19	**Beekeeping Journal Due in Lab (9 points)**	

4/19	Week 14 Watch Student Presentations	
4/24	Week 15 Moving Bees and The Future of Beekeeping	
4/26 – 4/30	**Final Exam**	

Columbus Laboratory Schedule

WEDNESDAYS
SECTION 1: 1:50 TO 3:40 PM
SECTION 2: 3:55 TO 5:45 PM

LOCATIONS:
334 Kottman Hall: https://goo.gl/maps/9yJG2fsGgEhSekbz9
Rothenbuhler Honey Bee Laboratory: https://goo.gl/maps/dy3uHg823hHSYGET9

Date	Description	Notes	Location
1/11	Lab 1: Bee development	Bring a laptop or tablet to lab	334 Kottman
1/18	Lab 2: Bee anatomy	Look at Graham Ch. 5 (111-165)	334 Kottman
1/25	Lab 3: Bee diversity	Guest Presenter	334 Kottman
2/1	Lab 4: Dance language, Part I	Dress to go outside today	334 Kottman
2/8	Lab 5: Dance language, Part II	Bring a laptop to lab	334 Kottman
2/15	Lab 6: Bee pheromones		334 Kottman
2/22	Lab 7: Pollen identification in honey	Bring honey to lab	334 Kottman
3/1	Lab 8: Equipment shopping	Read Delaplane Ch. 3	334 Kottman
3/8	Lab 9: Bee diseases	Guest Presenter State Apiarist Barb Bloetscher	334 Kottman
3/22	Lab 10: Colony modeling with BeeHave	Bring a laptop to lab	334 Kottman
3/29	Lab 11: Overwintered colony inspection (weather permitting)	Dress for beekeeping	Rothenbuhler Bee Lab
4/5	Lab 12: Installing packages and making splits (weather permitting)	Dress for beekeeping	Rothenbuhler Bee Lab
4/12	Lab 13: Disease detection, hive inspection and queen rearing (weather permitting)	Dress for beekeeping	Rothenbuhler Bee Lab
4/19	Lab 14: Inspecting new colonies, swarm demonstration (weather permitting)	Dress for beekeeping	Rothenbuhler Bee Lab

Wooster Laboratory Schedule

TUESDAYS 4:10-6PM

LOCATION:
Honey Bee Laboratory next to the Student Activities Center

Date	Description	Notes	Location
1/10	Lab 1: Bee development	Bring a laptop or tablet to lab	Bee Lab
1/17	Lab 2: Bee anatomy	Look at Graham Ch. 5 (111-165)	Bee Lab
1/24	Lab 3: Bee diversity	Guest Presenter	Bee Lab
1/31	Lab 4: Dance language, Part I	Dress to go outside today	Bee Lab
2/7	Lab 5: Dance language, Part II	Bring a laptop to lab	Bee Lab
2/14	Lab 6: Bee pheromones		Bee Lab
2/21	Lab 7: Pollen identification in honey	Bring honey to lab	Bee Lab
2/28	Lab 8: Equipment shopping	Read Delaplane Ch. 3	Bee Lab
3/7	Lab 9: Bee diseases	Guest Presenter State Apiarist Barb Bloetscher	Bee Lab
3/21	Lab 10: Colony modeling with BeeHave	Bring a laptop to lab	Bee Lab
3/28	Lab 11: Overwintered colony inspection (weather permitting)	Dress for beekeeping	Bee Lab
4/4	Lab 12: Installing packages and making splits (weather permitting)	Dress for beekeeping	Bee Lab
4/11	Lab 13: Disease detection, hive inspection and queen rearing (weather permitting)	Dress for beekeeping	Bee Lab
4/18	Lab 14: Inspecting new colonies, swarm demonstration (weather permitting)	Dress for beekeeping	Bee Lab

Sample Topics for Literature Review Papers

Topics are listed as examples only. Papers on topics not listed are **welcome and encouraged**.

Paper 1: Bee Biology

Life of Lorenzo Langstroth
Russian bees
Honey hunting
Bee breeding
Other bee species
Stingless bees in South America (*Melipona* or *Trigona*)
Bumble bees
Orchard mason bees
Leafcutter bees
Squash bees
Apis cerana or *Apis dorsata*
Bee biology
Bee taxonomy
Evolution of social behavior in bees
Karl von Frisch's dance language experiments
Bees as a model system for studying human disease
Division of labor in bees
Medicinal uses of bee products
Manuca honey
Apitherapy

Paper 2: Beekeeping

History
History of bee smokers
History of alternative hive designs
History of migratory beekeeping
Beekeeping in other cultures
Bee management
Resistance to American foulbrood (Hygienic behavior)
Resistance to Varroa mites
Swarm control methods
Establishing and maintaining observation hives
Allergic reactions to bee stings
New beekeeping pests (Tropilaelaps, Asian giant hornet)
New hive designs (Flow Hive, etc.)
"Treatment Free" or Organic beekeeping
Pollination
Almond pollination
Alfalfa seed production
Cranberry or blueberry pollination
Apple pollination
Pumpkin or cucumber pollination
Soybean pollination
Marketing
The Dyce process (creamed honey)
Mead making
Collection and uses of beeswax
Collection and uses of pollen
Collection and uses of propolis
Collection and uses of royal jelly
Collection and uses of bee venom
Collection and uses of unifloral honeys (manuca, sourwood, orange blossom, etc.)

Rubric for Literature Review Papers

Goal	Full Points	Reduced Points	Few or No Points	Points
1. Focused topic assessment.	Paper clearly focuses on one topic and provides necessary supporting information.	Paper mostly focuses on one topic, but sometimes unnecessary information distracts from focus.	Paper does not focus on one topic, and the main ideas are unclear.	/10
2. Detailed content and in-depth discussion.	Paper provides an in-depth, enlightening discussion of chosen topic. Student extends lecture content into integrated discussion of research-based information.	Paper provides competent discussion of chosen topic. Student includes research information, but relies too heavily on content taken from lecture materials and/or only partly integrates information.	Paper provides a shallow discussion on chosen topic. Student demonstrates little to no use of information that has not already been discussed in lecture materials.	/15
3. References are complete, used within text, and follow a standard citation format*.	At least four references are included in bibliography and within text, and follow the same citation format.	Reference(s) missing from bibliography and/or text. References do not follow the same citation format.	References absent.	/5
4. Spelling and grammar.	No/very few spelling or grammar errors. Quality of writing enhances communication of ideas.	Minor errors, sometimes distracting from the clear communication of ideas.	Errors distract from and/or hinder the clear communication of ideas.	/5
5. Paper follows required length and format.	Paper is 2-3 pages in length (8 ½" x 11", 1" margins, double-spaced, 12 point Times New Roman or similar font**).**	Paper is slightly under or over required length of 2-3 pages (8 ½" x 11", 1" margins, double-spaced, 12 point Times New Roman or similar font).	Paper does not meet required minimum of 2 pages, or does so by altering format (i.e. using a large font, altering page margins, etc.).	/5
			Total	/40

Example text and citations for journals and a web reference using APA format

"Although new comb resulted in greater brood production (Berry & Delaplane, 2001), old comb resulted in better brood survivorship (Berry & Delaplane, 2001; Free & Winder, 1983). Additionally, brood survivorship has been positively correlated with older comb in a national survey by the Bee Informed Partnership (2017)."

Berry, J.A & Delaplane, K.S. (2001). Effects of comb age on honey bee colony growth and brood survivorship. *Journal of Apicultural Research, 40*, 1, 3-8.

Free, J.B. & Winder, M.E. (1983). Brood recognition by honeybee (*Apis mellifera*) workers. *Animal Behavior, 31,* 2, 539-545.

The Bee Informed Partnership. (2017). [Bar plot of average winter survival and brood comb age.] *National management survey, Report: Average brood comb age*. Retrieved from https://bip2.beeinformed.org/survey/

For more help with APA citations, go to https://guides.osu.edu/c.php?g=605168&p=7880510