Course Outline

# Apiculture and Honey Bee Biology (Fall 2015)

## General Information

**Course Title:** ENVS\*2210 Apiculture & Honeybee Biology

**Course Description:**

This course is designed to acquaint the student with the honeybee in all aspects. It will include honey bee biology and behaviour, hive management for honey production, products of the hive, pests and enemies and the value of bees as pollinators of agricultural crops. Current issues related to bees will be highlighted.

**Credit Weight**: 0.50

**Academic Department (or campus):** School of Environmental Sciences

**Campus:** Main University of Guelph campus, Guelph

**Semester Offering:** Fall 2015

**Class Schedule and Location:** Mon/Wed/Fri, MACN 113, 9:30-10:20 AM

## Instructor Information

Instructor Name: Dr. Gard W. Otis

Instructor E-mail: gotis@uoguelph.ca; Telephone: 519-824-4120 x52478

Office location and office hours:

E.C. Bovey (ECBA) Room 2242

Tuesday 9:30-12:00 and Wednesday 10:30-1200 (other times by appointment, please)

## GTA Information

GTA Name: TBA

GTA Email: TBA

GTA office location and office hours: TBA

## Course Content

### Specific Learning Outcomes (and associated activities):

1. Discover relationships between honeybees and humans, other animals, plants, pests and diseases, and their environment. (Participating in lectures; synthesizing info for exams.)
2. Employ the Web of Science to search for references (Web of Science assignment)
3. Demonstrate the ability to critically evaluate information from scientific journal articles and other sources (Web of Science assignment and short paper.)
4. Effectively communicate ideas and information related to bees in written formats. (Demonstrated on exams and written paper.)
5. Understand how scientists “ask bees questions” in research (i.e., how are hypotheses formulated?). (This will achieved through questions that lectures are based around, through the readings from “Honeybee Democracy”, and by framing the short paper around a question.)
6. Understand current issues surrounding honey bees in the broad sense, including colony collapse disorder, risks due to Africanized honey bees, illegal trade of honey, and pesticide effects on honeybees.
7. Gain experience in observing nature (assignment to observe bees foraging on flowers).

### Lecture Content:

We will examine the world of the honeybee from all aspects. Specific topics (in approximate sequential order) are likely to include:

* Individuals vs. groups—life cycles of workers, drones, and queen (including mating) as well as the colony (through colony swarming, supersedure, and queenlessness)
* Honeybee foraging
* Sex and caste determination: Female vs. male (genetics), queens vs. workers (nutrition)
* Division of labour
* Form (morphology) and function (physiology)
* Honey bee species and races (special aspects of Africanized and Cape honeybees)
* Foraging and recruitment to food by means of a complex “dance language”
* Group decisions: special case of decision-making by swarms
* History of the relationship between humans and honeybees; history of beekeeping
* Fundamentals of beekeeping:
* Hive products—honey, beeswax, pollen, propolis, and royal jelly
* Large-scale commercial beekeeping
* Bee venom and hyperallergic reactions to stings
* Principles of bee disease; parasitic mites; colony collapse disorder
* Pesticides and bees, and the controversy surrounding neonicitinoid pesticides
* Role of bees in crop pollination; fundamentals of crop pollination
* Role of beekeeping in international development
* Honeybees as depicted in the movies-how do they film them?

### Labs: None

### Seminars: None

### Course Assignments and Tests:

| **Assignment or Test** | **Due Date** | **Contribution to Final Mark (%)** | **Learning Outcomes Assessed** |
| --- | --- | --- | --- |
| Quiz on course outline | Monday 21 Sept., in class | 5% | - |
| Bee Observation Assignment | 28 September (Monday, 11:59 PM, submitted through Courselink) | 10% | 1, 7 |
| Web of Science Exercise | 7 October (Wednesday, in class, as paper printed out copy. | 10% | 2, 3 |
| Midterm Exam | 19 October (Monday) | 25% | 1, 4, 5, 6 |
| Written Essay | 16 November (Sunday, 11:59 PM; submitted through Courselink) | 25% | 1, 2, 3, 4, 5 |

Additional Notes:

Read this course outline- there will be a quiz on the contents after the add period has ended.

Midterm 1 covers material up to Friday, 16 October.

The final exam covers material from 21 October to the end of the semester, plus other review and synthesis questions (to be specified in class).

### Final examination date and time: 12 December (Saturday): 2:30-4:30pm

### Final exam weighting: 25%

Final Examination regulations are detailed at: [Examination Regulations](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-exam.shtml)

## Course Resources

### Required Texts:

Honeybee Democracy, by Thomas D. Seeley (~$30 in hardcover, Kindle edition ~$23); available in bookstores on campus. One copy is on library reserve.

### Recommended Texts: None

### Lab Manual: None

### Other Resources:

### Outlines for lectures and powerpoint lecture presentations will be posted to CourseLink (you may know this as D2L) before lectures; links to videos shown in class will be posted to CourseLink after lectures. CourseLink will be used to post notices about the course, questions to consider before coming to class, reminders of deadlines, updates about our visit to the bee lab, and additional information related to course content. Please get in the habit of checking CourseLink every few days, and especially the night before lectures.

### Field Trips:

### Visit to Honey Bee Research Centre on Stone Road, Wednesday, 23 September. Students can drive, bike, or walk to the bee lab for one of four sessions throughout the day. The alternative rain date is Friday, 25 September. There is no cost associated with the visit. Honey from the university’s bee hives will be available for purchase. Detailed directions will be provided in class and on Courselink prior to the field trip.

### Additional Costs: None

## Course Policies

### Grading Policies

The dates of the midterm exam and final exam are fixed. Accommodations for an alternative exam may be made for personal health or compassionate reasons, with appropriate supporting documentation.

The “Foraging Bee Observation” is to be submitted through CourseLink **as a Word file** no later than 11:59 PM on Monday, 28 September.

The Web of Science assignment is due as a **hard copy (printout on paper)** during class on Wednesday, 7 October.

The Written Essay is to be submitted through CourseLink **as a Word file** no later than 11:59 PM on Sunday, 15 November.

Late submissions of all assignments will incur a 2% penalty for each day after the due date. If you do not normally work in Word, please plan ahead to be able to submit your work in the appropriate format at the library or by other means before the deadline. **Pdf files will not be accepted**

[Undergraduate Grading Procedures](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-grds-proc.shtml)

Please note that these policies are binding unless academic consideration is given to an individual student.

### Course Policy on Group Work: Not relevant to this course.

### Course Policy regarding use of electronic devices and recording of lectures:

Cell phones are to be turned off during class. Students using their cell phone during lecture will be asked to hand it over to the professor until the end of class. Laptop computers may be used during class, but only to take notes (unless instructed otherwise by the instructor). Electronic recording of classes is expressly forbidden without consent of the instructor. When recording of lectures is permitted, they are solely for the use of the authorized student and may not be reproduced or transmitted to others without the express written consent of the instructor.

## University Policies

### Academic Consideration:

The University of Guelph is committed to supporting students in their learning experiences and responding to their individual needs and is aware that a variety of situations or events beyond the student's control may affect academic performance. Support is provided to accommodate academic needs in the face of personal difficulties or unforeseen events in the form of Academic Consideration.

Information on regulations and procedures for Academic Consideration, Appeals and Petitions, including categories, grounds, timelines and appeals can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml).

### Academic Misconduct:

The University of Guelph is committed to upholding the highest standards of academic integrity. It is the responsibility of all members of the University community, faculty, staff, and students, to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Detailed information regarding the Academic Misconduct policy is available in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml).

Additional comments from Dr. Otis:

One of the situations in which you could inadvertently commit academic misconduct is in writing the short paper. If you “borrow” (i.e., “take”) an idea from someone else, you must paraphrase it (restate it in your own words) and cite the source of your information (i.e., author[s], year of publication). In contrast, if you include the exact wording from a source (which is only encouraged when the original wording is so good you feel you need to quote them exactly as they appear in the source material) those words must be placed within “quotation marks” and the source must be indicated (author, year, and page number).

Nearly alll information that you obtain from other sources must be referenced. There is an exception: you do not need to indicate a source for very basic information that is assumed to be common knowledge, such as, “Honeybees have six legs, two pairs of wings, and long mouthparts used to obtain nectar from flowers”.) Failure to provide a source suggests that the facts and opinions you have used are your own; if they are not your own, then that constitutes plagiarism. Copying words exactly, even just a few phrases copied from a larger document (very easy to do from electronic journal articles and websites), without using quotation marks is also plagiarism.

In fairness to you and to other students, academic misconduct will not be tolerated and will be dealt with firmly.

### Accessibility:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS), formerly Centre for Students with Disabilities (CSD), as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca or visit the [Student Accessibility Services website (http://www.uoguelph.ca/csd/)](http://www.uoguelph.ca/csd/).

### Course Evaluation Information:

End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions used as an important component in the Faculty Tenure and Promotion process, and as valuable feedback to help instructors enhance the quality of their teaching effectiveness and course delivery.

While many course evaluations are conducted in class others are now conducted online. Please refer to the [Course and Instructor Evaluation Website](https://courseeval.uoguelph.ca/) **for more information.**

### Drop period:

The drop period for single semester courses starts at the beginning of the add period and extends to the Fortieth (40th) class day of the current semester (the last date to drop a single semester courses without academic penalty) which is listed in [Section III (Schedule of Dates) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/). During the Fall 2015 semester, this date is Friday, 6 November.

The drop period for two semester courses starts at the beginning of the add period in the first semester and extends to the last day of the add period in the second semester.

Information about Dropping Courses can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/).

## Additional Course Information

From Professor Otis:

I became seriously interested in honeybees when my advisor in grad school received funding to study “killer bees” in South America. After a year and a half researching honeybee swarming biology in French Guiana, finishing my PhD degree, and a year studying comparative mating biology of African and European honey bees in Venezuela, I joined the University of Guelph in 1982. Since then I have been involved in both basic research (ecology, behaviour, diversity, and speciation) and applied research (benefits of feeding pollen to colonies in spring and fall; management of parasitic mites through chemical treatments and selective breeding). I have also led beekeeping development projects in Panama, Costa Rica, Indonesia, and Vietnam. Through my work with bees I have travelled to all 10 Canadian provinces and 25 different countries; become friends with wonderful people all over the world; worked with amazing students who have gone on to careers working with bees; had my eyes swelled shut for several days from bee stings; gotten sick with amoebic dysentery—2 times!; driven the roughest roads imaginable; eaten meals memorable for being both wonderful (amazing fruits in Asia, like mangosteens) and bizarre (e.g., a tie for worst between fresh goat’s blood with peanuts in Vietnam and fruit bats stewed in hot chilis in Indonesia). Honeybees have helped me to see the world around me more clearly as I have sought ways to get them to answer the research questions I have asked of them.

Do I like bees? Emphatically YES, I love them!

I hope you enjoy the class this semester.

Gard Otis