



HONEY BEE BIOLOGY

ENTO 489

This course is designed to introduce honey bee biology to science and non-science majors. Honey bees are the model organism for the study of social insects and social organization. You will learn how thousands of individuals, living as a single unit, divide and combine their efforts to reproduce, rear young, build a nest and forage for food. You'll learn why and how colonies swarm, how to decipher honey bee dance language, how bees use chemicals to communicate, why bees sting, the importance of bees as pollinators and much more. For more information see the attached syllabus, contact Dr. Tanya Pankiw, tpankiw@tamu.edu, ph: 458-0837, or the Department of Entomology at Texas A&M University, College Station, [Department of Entomology, Texas A&M University](#).

COURSE:

ENTO 489-701 Honey Bee Biology (3-0) Credit: 3
Semester being offered in: Fall 2004.

INSTRUCTOR:

Dr. Tanya Pankiw, Ph.D.
Department of Entomology
Rm 319, Heep Center
Phone: 458-0837
Email: tpankiw@tamu.edu
Course Web Site: <http://insects.tamu.edu/students/undergrad/ento489-bees/>
Username: beebio
Password: passwords will be issued to registered students

OFFICE HOURS:

MWF 10:00 – 11:00 am.
Other times by appointment only.

REQUIRED TEXT BOOKS:

The Biology of the Honey Bee. Mark L. Winston, 1987. Harvard University Press, Cambridge, Mass.
The Beekeeper's Handbook. Third Edition. Dianna Sammartaro and Alphonse Avitable, 1998. Collier Books. Macmillan Publishing Company, New York.

GRADING SCALE:

100%	-	90%	=	A
89%	to	80%	=	B
79%	to	70%	=	C
69%	to	60%	=	D
59%	to	0%	=	F (non-passing grade)

EXAMS:

Assignments	=	50%
Term Paper	=	25%
Final Exam	=	25%

EXAM POLICY:

All students must write a final exam.

TERM PAPER POLICY:

Without exception all students must write a term paper. Term papers must conform to the specified format.

COURSE DESCRIPTION:

This course is designed to introduce science and non-science majors to honey bee biology and beekeeping practices. Honey bees will serve as a model insect to introduce general principles of biology, entomology, and apicultural practices.

TOPICS:

Week	Topics	Assignment Due	Required Reading		
			On-Line Topic Notes	The Biology of the Honey Bee	The Beekeeper's Handbook Pages
1	Bees and beekeeping; evolution of bees; races of bees.		1, 2, & 3	Chapters 1&2	3-9
2	Colony organization and nest architecture.		9	Chapter 5	
3	Anatomy of the honey bee.		3, 4, & 5	Chapter 3	9-15; 158-161; 154
4	Nutrition, development and castes.	End of Week 4	6	Chapter 4	7-11; 55-63
5	Worker Behaviors		10	Chapters 6; 7, pgs 11-116; 3, 29-31	10-15
6	Communication and Orientation		11 & 12		
7	Beekeeping equipment and apiary sites.	End of Week 7		review Chpt. 5	24-39; 55-63
8	Getting started, spring management, and feeding.				34-39;49-73
9	Swarming and summer management.		16	Chapter 11	71-75;103-112
10	Nectar flows and pollination.	End of Week 10	10 & 18	Chapter 10; review pgs 56-59, 99	149-153
11	Honey extraction; fall and winter management.			116-123	75-82; 113-124
12	Pheromones		14 & 15		
13	Diseases, pests, and pesticides.	End of Week 13	20		125-148
14	Africanized bees.		17		
15	Final Exam				

PRESENTATION AND PAPER GUIDELINES

- COVER PAGE:** Must include your 1) Name, 2) Student Number, 3) Date, and 4) Title.
- LENGTH:** Five (5) page maximum. The cover page is not included in the paper length.
- SPACING:** Double.
- MARGINS:** 1"
- FONT:** Times New Roman, 12 pt.

FORMAT OF THE PRESENTATION OR PAPER**1) Introduction**

- a) What are you presenting (writing) and why is it interesting or important.
- b) Briefly outline the topics you will cover.

2) Body of the paper

- a) This is where you present information concerning the outlined topics.
- b) *All sources must be referenced. Plagiarism will not be tolerated*

3) Conclusion

- a) Present your personal conclusions, evaluations, or thoughts on the material you presented.

EVALUATION

Papers will be evaluated on the basis of 1) clarity, 2) accuracy of content, 3) amount of content that is beyond that presented in class, and 4) a demonstration of personally derived conclusions.

PAPER TOPIC SUGGESTIONS

These are only suggestions. You are free to develop your own topic provided it is about honey bees.

HISTORY OF BEEKEEPING

- The history of beekeeping in the Americas.
- The history of beekeeping in the U.S.
- The history of beekeeping in Texas.
- Archeology of beekeeping.

ORIGIN, GEOGRAPHICAL DISTRIBUTION, AND CHARACTERISTICS OF HONEY BEES

- Evolution and geographical history of honey bees.
- Honey bee species.
- Races of honey bees.

THE LIFE HISTORY OF THE HONEY BEE COLONY

- Nest construction and architecture.
- Seasonal cycle of honey bee colonies.
- Caste development and differentiation.
- Swarming and supersedure.

THE STRUCTURE AND FUNCTION OF HONEY BEES

- Mechanism of reproductive isolation in honey bees.
- Sensory organs.
- Chemical communication.
- Vision.
- Structure of legs and pollen foraging.
- Structure of legs and grooming.
- Structure and function of the stinger and venom glands.

THE BIOLOGY AND BEHAVIOR OF HONEY BEES

- Biology and behavior of queens, workers, or drones.
- Dance language.
- Defensive behavior.
- Pheromones and their role in society.

THE ORIGIN, PROPERTIES, PRODUCTION OF HIVE PRODUCTS AND THE USES OF HIVE PRODUCTS BY BEES AND/OR HUMANS

Honey
Pollen
Wax
Propolis
Venom
Honey wines and the art of making honey wines.
Medicinal uses of hive products: fact or fiction.
Bee venom and allergic reactions.

BEE GENETICS AND BREEDING

Mechanism of sex determination in the honey bee.
Instrumental insemination of honey bees: history and utilization.
Africanized bees: origin, migration, and distribution.
Africanized bees: biology, behavior, and management.
Africanized bees: impact on society.
Africanized bees: myths and facts.

DISEASES, PARASITES AND PESTS OF HONEY BEES AND THEIR TREATMENTS

Bacterial diseases.
Fungal diseases.
Viral diseases.
Protozoan diseases.
Tracheal mites.
Varroa mite.
Predators of honey bees.

OTHER TOPICS

Art in beekeeping.
Bees in the arts (e.g. paintings, cartoons, jewelry, textile design, etc.)
Bees in science fiction, mystery, etc. films.
Laws pertaining to beekeeping: Texas Bee Act
Bees in the urban environment.
Honey bees as resources for teaching.
Honey bees as recreation.
Honey bees in folklore.
Honey bees in literature.
Honey bees in culture.

American Disability Act

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If a student believes he or she has a disability requiring an accommodation, he or she should contact the Office of Support Services for Students with Disabilities in Room 126 of the Koldus Building (845-1637) so that such accommodations can be made. [Services for Students with Disabilities, Department of Student Life, Texas A&M University](#)

Aggie Honor Code

“An Aggie does not lie, cheat or steal, or tolerate those who do.” [Know the Code](#)