



# Biology Through Bees – Biology 105

Fall, 2004

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843-3557 – FJ 106W



Day	Date	Topic	Assigned Reading
Th	Aug 26	Introduction – WebCT “Introduction” <sup>1</sup> – Pre-course Quiz	S1 <sup>2</sup>
Tue	31	Overview of Bees – “Basic Bees” – Drop Period Ends	
Wed	Sep 1	Extended Drop Period Ends	
Th	2	Natural Selection and Microevolution	S16
Tue	7	Macromolecules, Discussion	S3,SH-Autumn <sup>3</sup>
Th	9	Macromolecules - continued	
Tue	14	Cell Structure, Bacteria	
Th	16	Ground Rules of Metabolism, Discussion	
Tue	21	Metabolism – continued, Review	S5, SH-Winter
Th	23	<b>Exam 1</b>	
Tue	28	Photosynthesis 1 & 2	S6
Th	30	Photosynthesis - continued	
Tue	Oct 5	Respiration, Discussion	S7
Th	7	Respiration - continued	
Tue	12	Discussion	SH - Spring
Th	14	<b>Exam 2</b>	
Tue	19	Fall Recess	
Th	21	Mitosis - Withdraw Period Ends	S8
Tue	26	Meiosis	S9
Th	28	Haplodiploidy and Altruism	S(p712-715)
Fri	29	Skeleton and Flight and Muscles -	S(p546-551), ,
Tue	Nov 2	Discussion	SH-Summer
Th	4	Plant Evolution and Reproduction	S22
Tue	9	<b>Exam 3</b>	
Th	11	Population Ecology	S39
Tue	16	Thanksgiving Recess	
Th	18	Population Ecology,	S(p752-753, 758-760)
Tue	23	Pollination Biology - Discussion	B&N 1-4 <sup>4</sup> , Johnson & Steiner <sup>5</sup>
Th	25	Diversity Fractured Fairy Tales, Plant Crisis	B&N 6
Tue	30	Killer Bees & Holding the Globe in Our Hands - Discussion	B&N 8
Th	Dec 2	<b>Exam 4</b>	
Tue	7	Final Exam Review	
Mon	13	<b>Final Exam – 13:00</b>	

**Laboratory meetings are on Thursdays from 12:45-15:30 in FJ-145W.**

<sup>1</sup> These are lecture notes and PowerPoints posted on the WebCT course

<sup>2</sup> Starr, C. 2000. *Biology Concepts and Applications*. Brooks/Cole.

<sup>3</sup> Hubbell, S. *A Book of Bees*. Houghton Mifflin.

<sup>4</sup> Buchmann, S.L. and G.P. Nabhan. 1996. *The Forgotten Pollinators*. Island Press. – On Reserve in Burrow Library

<sup>5</sup> Johnson, S.D. and K.E. Steiner. 2000. Generalization versus specialization in plant pollination systems. *TREE* 15:140-143. – On reserve in Burrow Library

## Grading

Lecture Material	
4 exams .....	300
(the lowest dropped)	
Final exam .....	100
Quizzes .....	50
(there will be daily, web-based quizzes)	
Laboratory Material	
Drawings, worksheets, reports, etc. ....	100
Subjective impression of overall contribution to the class .....	<u>50</u>
	600

In order to help you keep track of what your final grade will be, you are guaranteed at least the grades below.

92%	(552 points)	A	“Excellent”
90%	(540 points)	A-	
82%	(492 points)	B	“Good”
80%	(480 points)	B-	
72%	(432 points)	C	“Satisfactory”
70%	(420 points)	C-	
62%	(372 points)	D	“Passing”

## Objectives

My objective in offering this course is to provide you an opportunity to learn something about the study of life in the natural world. This will be a rigorous course in which the honeybee is used as the thread of continuity. That is, throughout the course we will cover material need to answer specific [questions](#) dealing with honeybees. Please note, this is not a “Biology of Honeybees” course, but instead, “Biology Through Honeybees”. If you are expecting to learn how apiary management this course will help, but it is not the most appropriate course for you.

Another objective of mine is that through the reading, memorizing, thinking, and synthesis you will do you will in some way become changed. That is, an emphasis of mine is that you learn factual knowledge and to learn fundamental principles thereby becoming a changed person. If you are completely satisfied with yourself and are uninterested in exploring yourself and the world around you, please consider another course.

## Expectations

### Professor’s

It is important I make my expectations clear. Most importantly, you are expected to be involved with the material. If you are not, then you are wasting both of our time. While there is no attendance policy in this course, if you miss a class for an unexcused (in my opinion) reason, you are responsible for obtaining and understanding the material presented from someone other than me. If you miss a quiz for an unexcused reason (e.g. oversleeping, travel problems, vague illness, another course responsibility) you will receive a zero for that quiz. Quizzes will be available on WebCT at least 24 hours before class. They will be unavailable 20 minutes before

class. Similarly, no make-up exams will be given. Laboratory attendance is required if you are to receive credit for these exercises. All classes will start on time. Late arrivals are disruptive. While these expectations may seem harsh, I feel it is important that they be followed closely if the course is to run smoothly.

Why are you expected to be involved with the material? I feel it is essential that you gain factual knowledge such as terminology, classifications, and methods. It is also essential that you learn fundamental principles. With these you will be able to apply the course material to solve problems and improve your thinking skills. These specific skills and competencies are important no matter what profession you choose.

My expectation is that learning about the natural world in this class will result in a deeper appreciation of life around you. That is, my hope is that you will gain an appreciation of the intellectual activity of science than can add breadth and depth to your world. For example, a simple flower can be seen from the perspectives of art, literature, history, and even psychology. After this class a simple flower will have the added dimensions of evolution, the mechanics of photosynthesis and respiration, genetics, and interactions with pollinators.

### **Students'**

I can only assume what your expectations are. I assume you would like fair and equal treatment, i.e. no special favors given to your classmates over you. I assume you want your professor to be committed to presenting the best survey of biology realistically possible in a three-hour lecture-lab course. I assume you want a personal interest taken in you and your learning. I assume you have an expectation that tests will cover important points in the course and that they will be graded carefully and returned in a timely fashion. Hopefully you want to be challenged enough so that you achieve new insights about the world around you. You may expect that if you have a legitimate criticism of the course, or how you were evaluated, that this criticism will be seriously considered.

### **Laboratory Schedule**

<b>Lab</b>	<b>Date</b>	<b>Topic</b>
Lab 1	Sep 2	Hive Observation Begins
Lab 2	Sep 9	Bee Anatomy
Lab 3	Sep 16	Bee Dissection and Disease Quantification
Lab 4	Sep 23	Pollinator Observations
Lab 5	Sep 30	Waggle Dance Interpretation
Lab 6	Oct 7	Statistical Analysis of Data
Lab 7	Oct 14	Chlorophyll Extraction and Chromatography
Lab 8	Oct 21	Antibiotic Aspects of Propolis
Lab 9	Oct 28	Flower Structure
Lab 10	Nov 4	Student Projects
Lab 11	Nov 11	Student Projects
Lab 12	Nov 18	Student Presentations of Hypothesis Testing

## Laboratory Worksheets, Reports, Drawings, and Journaling

These will be due at the beginning of lab the week following the lab's completion unless otherwise instructed.

Part of your "laboratory time" will be spent journaling. Careful observation and clear communication are important aspects of science. You are expected to do two things in your journals. The simpler of these two expectations is to record your observations of the hive. For example, how has it changed since the last time you observed it? Are there individuals behaving uniquely? What is the queen doing? What is predominant color of pollen being collected? A more difficult aspect of your journaling will be "reflections." For example, what insights have you gained from your observations or how has your world view changed? What questions have been stimulated or mysteries posed?

## Laboratory Philosophy

Part of this course involves experiences in the laboratory. As you know, you are required to have at least one science course with a laboratory. Apparently somebody at some time felt that a lab experience was important to liberally educated students. What is the significance of these experiences?

I have constructed the lab experiences in a way that will give you an abbreviated taste of what scientists do to answer questions. At some point we will be formulating hypotheses and conducting experiments to test these hypotheses, and we will work with common methods used by scientists. These activities will reinforce concepts discussed in class as well as introduce new ones. These laboratory exercises are therefore significant in that they will give you a sense of how questions are answered.

You are expected to attend all laboratory meetings. These classes **cannot** be "made up". Please be on time. Late arrivals are disruptive and require repetition of explanations. Some of the lab exercises will involve the completion of worksheets or other material to be handed in. You are also expected to be involved in the activities of the group. You will find that if you are enthusiastic and involved, the exercise is much more enjoyable and rewarding.

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I have read the syllabus, grading schedule, expectations, disclaimer and philosophy and objectives for Biology 105, "Biology Through Bees." I fully understand what I have read and have no questions.

Print Name \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_  
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