All components of the summer assignment—including (1) written laboratory plant, (2) bound composition notebook for lab, and (3) e-mail response—are due on the first day of class: Thursday, September 7, 2017.

CONTRACT & CHAPTER 1 *Due Friday, September 8, 2017*

With a parent or guardian, carefully read the course syllabus and sign the contract page.

Read Hills Chapter 1, and answer the following questions:

1. Describe how organisms acquire and use energy. (Concept 1.1)
2. Summarize how the information contained in DNA is used by organisms. (Concept 1.2)
3. Describe TWO examples of how organisms interact with or affect their environments. (Concept 1.3)
4. Summarize the process of natural selection. (Concept 1.4)
5. Explain the purpose of applying statistical methods to scientific experiments.

CHAPTER 41 *Approximately 75% of this assignment is due in class on Monday, September 11, 2017*
The completed assignment, in its entirety, is due Tuesday, September 12, 2017

Read Hillis Chapter 41 and answer ALL concept questions (41.1–41.6) in complete sentences EXCEPT for the first question in concept 41.2. Most of these questions can be answered in one or two sentences.

Hints:

- In concept 41.3, adaptive value refers to the usefulness of a trait.
- In concept 41.6, sexual dimorphism refers to differences in characteristics (in this case they ask about body size) between males and females.
- Also in concept 41.6, an organism that is haploid only carries one copy of each chromosome in its cells; most organisms are diploid, which means that they carry two copies of each chromosome in their cells. In the discussion of eusocial insects (wasps, bees, and ants) on page 816, it is important to note that these organisms reproduce using a process called parthenogenesis, which results in males that are haploid and females that are diploid and creates some very strange social interactions.

Questions for Thought

These questions are NOT required, but may promote some stimulating thought and discussion. You should be able to answer each of the following questions at the end of the chapter.

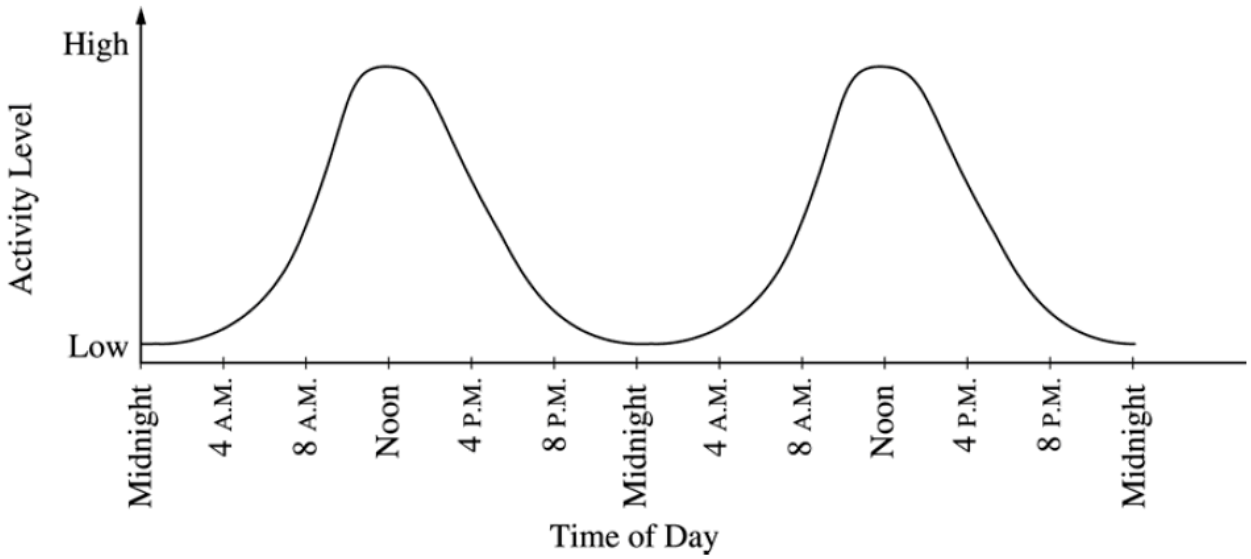
1. What causes some bees to leave rotting corpses sitting around their hives?
2. What is the role of genetics in the development of bisexual fruit flies and mice?
3. How does evolution drive some animals to be promiscuous?
4. How is it that bees and naked mole-rats can spread their DNA better by NOT reproducing than by having children?

CHAPTER 2 *Approximately 75% of this assignment is due in class on Monday, September 18, 2017*
The completed assignment, in its entirety, is due Tuesday, September 19, 2017

Read Hillis Chapter 2 and answer concept questions 2.3, 2.4, and 2.5 in complete sentences. Most of these questions can be answered in one or two sentences. Be sure to read concept 2.2 thoroughly before attempting to answer the concept 2.3 questions.

ESSAY 1 *Due Wednesday, September 20, 2017*

Answers must be written out in paragraph form. Outline form is not acceptable. Labeled diagrams may be used to supplement discussion, but a diagram without a written explanation will not receive credit. You must cite the source of all information you mention. Include the page number of information from the textbook or the web address of information found online.



Many organisms have circadian rhythms that exhibit an approximately 24-hour cycle, in which activities change at regular time intervals within the cycle. Circadian rhythms are controlled by both genetics and environmental conditions, including light. The graph above depicts the activity cycle for a population of squirrels found on an area of parkland aside a temperate deciduous forest over a 48-hour period.

(a) **Describe** the cycle of activity for the squirrels. For each of the following factors, **provide reasoning** to connect the factor with squirrel circadian rhythms and **explain** how evolution could be driven by the factor to result in the observed activity pattern.

- predation
- mating behavior

(b) **Propose** a hypothesis regarding the effect of light on the cycle of activity in this group of squirrels. **Describe** the independent and dependent variables in an experiment that could be performed to test this hypothesis. **Describe** an appropriate control treatment for the experiment, and **explain** how the control treatment would increase the validity of the results. **Predict** the experimental results that would support the hypothesis.

CHAPTER 3 *Approximately 75% of this assignment is due in class on Monday, September 25, 2017*
The completed assignment, in its entirety, is due Tuesday, September 26, 2017

Read Hillis Chapter 3 and answer concept questions 3.1, 3.3, and 3.4 in complete sentences. Most of these questions can be answered in one or two sentences. Be sure to read 3.2 thoroughly and come prepared with questions or specific points of confusion you would like to go over in this section.