CHAPTER 30 *Approximately 75% of this assignment is due in class on Monday, March 20, 2017*
The completed assignment, in its entirety, is due Tuesday, March 21, 2017

Read Hillis Chapter 30 and answer ALL concept questions (30.1–30.4) in complete sentences EXCEPT for the last question in Concept 30.2.

Hint: The last question in Concept 30.3 is asking how the brain interacts with the anterior pituitary gland and how the brain interacts with the posterior pituitary gland.

STUDY PLAN *Due Friday, March 24, 2017*

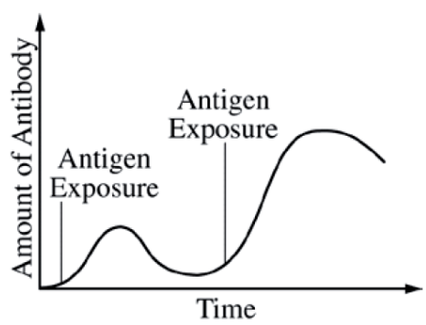
Create a detailed study plan and calendar for how you will use the four weeks between March 24 and May 8 to prepare for the AP Biology Exam.

CHAPTERS 28 & 31 *Approximately 75% of this assignment is due in class on Monday, March 27, 2017*
The completed assignment, in its entirety, is due Tuesday, March 28, 2017

Read Hillis Section 28.1 and answer the first concept question.
Read Hillis Section 28.2 and answer the first concept question.
Read Hillis Chapter 31 and answer all concept questions 31.1–31.4 (NOT 31.5) EXCEPT for the last question in Concept 31.3.

ESSAY 4 *Due Wednesday, March 29, 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.



The graph above shows changes in an individual's humoral response when exposed to the same antigen at two separate points in time.

(a) **Describe** FOUR steps in the activation of a specific immune response following the initial exposure to the antigen, and **connect** the trend in the graph to the production and/or activity of a specific immune system cell.

(b) **Predict** how the trend in the graph would be different if the two exposures were each from a different antigen. **Justify** your prediction.

(c) The Human Immunodeficiency Virus (HIV) compromises an individual's immune response by infecting vital components such as helper T cells, dendritic cells, and macrophages. **Describe** ONE component of an individual's immune response that would NOT be compromised by HIV infection. **Provide** reasoning to support your description.

(d) **Explain** the difference between an infection caused by an antigen and an allergy caused by an antigen.

CHAPTER 34 *Approximately 75% of this assignment is due in class on Monday, April 3, 2017*
The completed assignment, in its entirety, is due Tuesday, April 4, 2017

Read Hillis Chapter 34. Answer the following concept questions in complete sentences:
Concept 34.1 (questions 1 & 2); Concept 34.2 (questions 2 & 4); Concept 34.3 (questions 1, 2, & 4);
Concept 34.4 (question 1)

ESSAY 5 *Due Friday, April 7, 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.

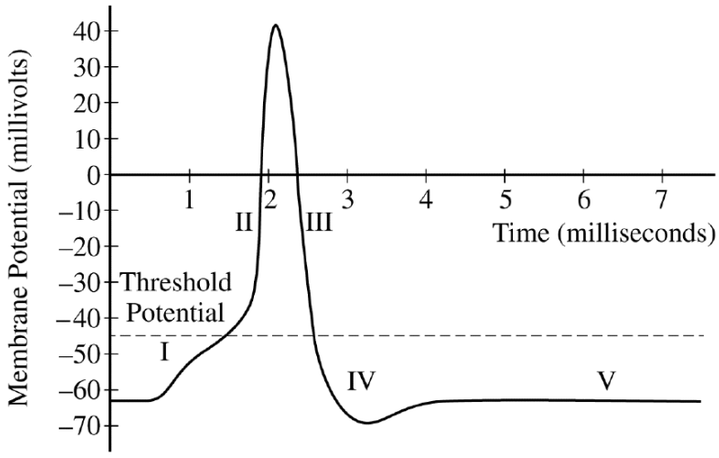


Figure 1. Membrane potential during an action potential

	Concentration (mM)	
Ion	Cytoplasm	Seawater
Na^+	50	460
K^+	400	20
Ca^{2+}	.5	10
Cl^-	50	560

Figure 2. Ion concentration in axon's cytoplasm and seawater bath outside the cell during stage V

The giant squid is a model system for studying neural communication because the axon and nerve endings are so large that they are relatively easy to manipulate and study. The graph in Figure 1 represents the changes in membrane potential during an action potential. The data in Figure 2 were recorded from the large axon of a giant squid motor neuron and show the concentrations of three ions both inside the axon's cytoplasm and outside the cell, in a seawater bath, during stage V of Figure 1.

(a) **Describe** how the plasma membrane of a motor neuron regulates its permeability to Na^+ and K^+ during an action potential.

(b) **Predict** the changes in the Na^+ and K^+ concentrations during stages II and III of the action potential shown in Figure 1. **Justify** your predictions.

(c) **Describe** how the signal is transmitted across the synapse from the terminal branches of the motor neuron and how the signal is received by an effector muscle.

(d) Animals of the Phylum Chordata possess a hollow dorsal nerve cord, which allow for the possibility of a reflex arc in emergency situations. **Describe** TWO ways that a reflex arc differs from a typical stimulus-response pathway and **provide reasoning** to support the claim that reflex arcs provide an evolutionary advantage in emergency situations.

PRACTICE EXAM *Due Wednesday, April 19, 2017*

Complete all sections of Goldberg's (*Barron's* review book) Practice Exam 1.

CHAPTERS 37–40 *Approximately 75% of this assignment is due in class on Wednesday, April 19, 2017*
The completed assignment, in its entirety, is due Thursday, April 20, 2017

Read Goldberg (*Barron's* review book) Chapters 11–12 and answer the following question in complete sentences. Thoroughly skim Hillis Concept 36.1 and Chapters 37–40 to supplement the Goldberg reading.

For each component in the table below, **describe** the structure of the component and **explain** how the structure relates to the function of the component.

Component	**System**	**Hillis Reference**
Alveolus	Respiratory	Concept 37.3
Capillary	Circulatory	Concept 38.5
Nephron	Excretory	Concepts 40.3–4
Sarcomere	Muscular	Concept 36.1
Villus	Digestive	Concept 39.3

BOOK RETURN *Due Tuesday, May 9, 2017*

Bring your Hillis textbook to class. Please be sure to have the exact copy of the book that will match your book receipt.