**Study Guide**

**Chapter 2: The Biological Perspective**

1. What is a neuron? About how many do you have? (100-200 billion)

2. Describe a neuron using the terms dendrites, cell body, axon, and myelin sheath. What are three types of neurons?

3. What is an action potential and what type of energy does it represent? What is a “threshold” in this context? Is there every any weak or partial firing?

4. What type of energy do neurons use in communicating with each other? What is/are a synapse, synaptic gap, synaptic cleft, and synaptic vesicle? (There are up to 100 trillion synaptic interconnections in your brain alone.)

5. You should be able to describe what happens at the synapse, starting with the arrival of the action potential. What are receptor or binding sites? Why is this called a "lock & key” system? What happens after the neurotransmitter has returned to the synaptic gap from the receptor site? What is reuptake? What is the process that happens if it does not occur and what is it called?

6. What are neurotransmitters? About how many different ones have been identified? You should be able to recognize descriptions of the functions of these four:

1) Acetylcholine: required for muscle contraction

2) Dopamine: Lack of it is a factor in Parkinson’s disease; an excess is related to

schizophrenic hallucinations.

3) Serotonin: regulates moods; lack of it is related to depression,

4) Endorphins: the body’s endogenous morphine and reduce the perception of pain.

7. Psychoactive drugs work by altering the function of the neurotransmitters. What does an agonist do? What does an antagonist do? What does it mean to inhibit reuptake?

8. What does the Central Nervous System consist of?

9. What are the two primary divisions of the peripheral nervous system?

10. What is a nerve made up of? Which part of the nervous system does it belong to?

11. What part of the Central Nervous System controls a simple reflex?

12. What is the master gland of the endocrine system? With which brain structure does it work most closely?

**The Brain**

**You should be able to associate the parts, structures, or locations on the brain that have been discussed in class and/or included in your textbook with their primary function(s).**

1. What technologies have been and are being used to study the brain? Briefly, how does each one work, and does it show brain structure or brain activity?

2. What are the three structures in the hindbrain? What is the main or primary function of each?

3. What does the reticular formation do?

4. What do the thalamus and hypothalamus do? Which one is associated with the pituitary gland and endocrine system?

5. The limbic system overall is associated with emotion. Specifically what structure is associated with rage and fear?

6. Which structure in the limbic system is involved in making new neurons and processing new memories?

7. Cortical lateralization means to locate some mental function on either the right or left hemisphere of the \_\_\_\_\_\_\_\_\_\_?

8. Name the four lobes of the cerebral cortex. (Remember there are actually eight, because each one is represented on both the right and left hemispheres.) What is the main or primary function associated with each lobe?

9. Why are parts of the body not represented in proportion to their size or mass on the motor and sensory cortexes? What principle seems to be in operation here?

10. What is an association area and what happens there?

11. Is it true that humans only use 10% of their brains?

12. What is aphasia? What functions happen at Broca’s and Wernicke’s areas?

13. What happens when you sever the corpus callosum? (There might be a question concerning odd behaviors of split-brain patients.)

14. What is a hemispherectomy? Can a person function normally after this procedure?

15. What is the concepts of functional plasticity?

16. How do you maximize your brain's potential?

17. What is the blood-brain barrier, and what does it do?