The study guide below contains a list of topics we’ve covered in class that potentially could be on your exam. Note that you are responsible for all the material covered in lecture, as well as assigned readings on your syllabus, or handed out in class. Good luck, and e-mail me if you have any questions!

1. We began the course by going over several themes such as homeostasis and integration of physiological traits. What is the importance of each of these concepts to our ability to maintain life?

2. What are the different levels of biological organization? Can you identify each one?

3. What is matter? What are the 2 different ways I can change it? Which way affects the arrangement of atoms? Which one doesn’t?

4. There are several types of work that can be done in biological systems, and many types of energy to help us accomplish that work. How is energy stored in biological systems, and why is energy transfer never 100% efficient? Finally, what are the two types of chemical reactions?

5. We talked about atoms, and what differs in atoms to make different elements. There are 3 types of subatomic particles. What are they, what is their role, and what happens to an element if I change the # of any one of those subatomic particles?

6. Understand the concept of electron shells, and how they apply to chemical bonds. What are the two types of chemical bonds? What conditions (i.e. what is it about the electron shells) lead me to each one?

7. What are the 4 types of biomolecules? What common characteristics do these groups have? What makes each group distinct (i.e. what are the unique characteristics of each group?)? What is the role of each group of molecule in our bodies?

8. How do we overcome activation energy barriers in chemical reactions?
9. What is the **role and structure** of the nucleus? The plasma membrane? What **specializations** do I find in plasma membranes of different tissues? Can you give an **example** of where you would find these specializations?

10. **Cytoplasmic organelles.** Be able to identify their function. In what tissue would I find more of a particular organelle? Why?

11. Understand the different methods by which solutes can be transported across a cell membrane. Which methods require ATP? Why do those methods require ATP?

12. Understand **mitosis**, and what happens in each stage. This is really the first **process** that we’ve talked about this semester; make sure you take the time to understand everything about this process.

13. **Protein synthesis.** Make sure you understand this in as much detail as I went into.

14. Understand the different types of **membranes** (and where you find them) and their secretions.

15. Function of each epithelial layer.

16. What are the various **skin appendages**, and what is their function? Do they function all the time, or some of the time? For our entire lives?

17. What are various **disease states** associated with the skin? Other **pathologies**?

You are also responsible for some lab material:

1. Directional terms (anterior, posterior, etc)
2. Tissues and tissue types

In addition to understanding these topics, other useful study tips might include:

- Working through the questions/key concepts at the end of the chapters
- Forming a study group. Explaining concepts to your peers is a great way to learn; similarly, getting things explained to you in a different way (i.e. not by me) may also be beneficial.
- I know I sound silly, but try to be rested in the days leading up to the exam; you will retain more information if your brain is rested.
- Clarify “sticky” subjects early—please don’t wait until Wednesday night to try to get “unstuck”!