Study guide 1

(Cell biology is not a linear course, there are many things (those that happen inside the cells and those that are related) that you should try to understand and to remember, the study helps you generally, but we can't guarantee that these are just what you need to know)

Lecture 1:

1. Think about why you want to study Cell Biology.
2. Understand the theory of cell and the history of cell theory.
3. What are the general differences between eukaryotic cells and prokaryotic cells?
4. Understand all cells have constancy in four remarkable aspects.
5. Think about the evolution of life.
6. Understand the common ways of gene evolution.
7. What are the common model systems used in cell biology?

Lecture 2:

1. Be able to tell the resolution ranges for typical light microscopes and electron microscopes, which level of cellular structure can be resolved by each microscope. (The second slide of Lecture 2).
2. Understand how resolution is calculated, what factors determine the resolution, how?
3. How does each of the four common light microscopes work? What are their strength and weakness?
4. How does the fluorescence microscope work?(the principle) What are fluorescence probes, what are the excitation /emission characteristics? Know typical probes wavelength ranges (not exact, but generally, such as red, green, blue, etc)
5. Know that indirect fluorescence not only provides a more economic way but also provides better specificity over direct fluorescence.
6. Understand the principle of confocal microscope and the two different categories (spinning disk and laser scanning).
7. Know how FRET, photoactivation, FRAP work and what application each is used for.
8. Understand how Immunogold, Scanning electron microscope and transmission electron microscope work, what are their strength and weakness.