

Review for Biophysics 400

About the Test:

The test will cover Ch. 1-7 in the textbook – An Introduction to Biophysics by Nordlund. You will be allowed to take a calculator, writing utensil and one sheet of notes in to the test. You will be given a blue book and the exam questions. There will be two hours to complete the exam – though if you are feeling rushed you can stay later than the two hour time limit. Note: You may only stay later if you arrive on time. Get there early! Your sheet of notes will be very important. You should write down any equations or typical values you think might be useful. If we used the equation in class you should definitely have it on your sheet of notes. You could also write down how to solve particular homework problems if it suits you. Anything in the lecture or text will be fair game – yet most of what we will ask we went over in class so reviewing your class notes will be your best study tool. Also, reviewing the problems is a good idea as well.

Review by Chapter:

Ch. 1-3 we focused on problem solving abilities – asking the right questions, modeling systems, estimating quantities, and dimensional analysis. All the problems will focus on these problem solving abilities along with using the equations that we discussed in the lecture.

Ch. 4 Water – Water has some very interesting properties. Review the structure of water and how that structure sets the molecule's physical properties.

Ch. 5 Biomolecular Structure – This chapter reviewed the basics of biomolecular structure. We talked about the 4 classes of molecules and the structures of each. Review these structures and be ready to identify molecules. We also talked about how forces are involved in determining structures. Make sure you review the types of forces and their relative strengths.

Ch. 6 Membrane Structure (Supramolecular Structure) – We talked about the role of membranes and their structure. Pay particular attention to the Fluid mosaic model of the membrane and modeling the membrane as a rod. We particularly went over stretching and bending this rod.

Ch. 7 Cellular Structure – We talked about the two types of cells (Eukaryote and Prokaryote) and modeling the minimal cell. We then went on to talk about different structures within the cell and modeling them biophysically – mitochondria, flagella, ER/Golgi, sensory systems. We will talk more about molecular motors later, so here pay more attention to the cell as a whole. How does the cell sense, move, make energy, reproduce?

Techniques – We talked about different techniques to determine structures (X-ray crystallography, NMR, AFM, EM). Review how these techniques work and when to use each.