

## Cbb752b25 Quiz #2 Study Guide

There are some topics in lectures that we drilled down into detail. Here is a list of those topics that you should know in detail for the quiz:

- Know about the definition of sensitivity and specificity
- The dimension of SVD decomposition
- Know how to construct a decision tree
- How to calculate convolution (with stride/padding). How to do max pooling.
- Network quantities (clustering coefficient & path length)
- Concept in digital image segmentation. Definition, procedures, and evaluations.
- Understand different types of activation function in deep learning.
- How to calculate a gradient for deep learning given a loss function or an activation function (understand backpropagation)
- How to calculate bond angles and dihedral angles of linear polymers
- What atoms are Phi/Psi dihedral angle side chain angles defined by? What is a Ramachandran plot and where are the major regions ( $\alpha$ -helix/ $\beta$  sheet)?
- Understand why protein cores have smaller packing fraction than the densest packing fraction for hard spheres
- High level understanding of VAE and its variation (e.g. Wasserstein Variational Autoencoder), including architecture, reparameterization trick, and loss function
- High level understanding of GAN architecture
- Know about how to define the backbone/sidechain dihedral angle

For all other topics, you should understand at a high level, i.e., the contents of the lecture.

Quiz #2 will cover everything from the 2nd half of class, including the four TF lectures

You can find all slides on the class website: <http://cbb752b25.gersteinlab.org/syllabus> , and all recorded lectures on canvas->media library.

Examples of previous quizzes may also be helpful to get an idea of what may be on this year's:  
<http://cbb752b25.gersteinlab.org/quiz>